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Zentralwerkstatt und Ersatzteildepot für ORION- und ISP-Produkte

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Service Manual

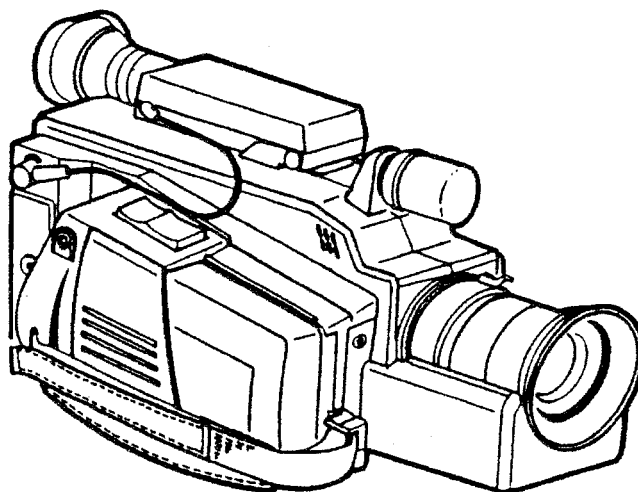
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ORION VIDEO MOVIE



ORIGINAL VERSION
mit Änderung

VMC-226 HS VMC-347 S



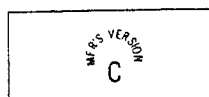
CCD
CHARGE COUPLED DEVICE

AF AUTO FOCUS

Bei technischen Änderungen können Ergänzungsblätter
angefordert werden.

Specifications are subject to change without notice.

MFR'S Version:



Bestell-Nr.:

3861

SAFETY MODES

1. Supply and Take-up reel

Symptom: 'EMG: TUP' will blink on the lower right of screen.
Trouble: Absence of reel pulse (at least on one side of Supply side or Take-up side for 5 second during PLAY and REC mode.
Absence of reel pulse (at least on one side of Supply side or Take-up side for 2 second during CUE mode.
To cancel operation: Turn the POWER SW off.
Leave the unit for 5 minutes.

2. Loading and Unloading

Symptom: 'EMG: LDM' will blink on the lower right of screen.
(The position is the same as STBY or REC.)
Trouble: The mode switch doesn't operate even if the loading motor runs for more than 10 seconds.
Corrective action: Stop the loading motor.
To cancel operation: Turn the POWER SW off.
Leave the unit for 5 minutes.

3. Cylinder

Symptom: 'EMG: CYL' will blink on the lower right of screen.
Trouble: Absence of FF 25Hz for the cylinder for 2 seconds.
To cancel operation: Turn the POWER SW off.
Leave the unit for 5 minutes.

SPECIFICATIONS

Format:	VHS-C
Power source:	DC 9.6V
Power consumption:	Approx. 7.5 watts
Signal system:	PAL color system
Video recording system:	4 rotary heads, sequential helical scanning system
	Luminance: FM azimuth recording
	Color signal: converted subcarrier phase shift recording
Audio track:	1 track
Cassette tape:	VHS-C Cassette
Tape speed:	SP: 23.39 mm/sec. LP: 11.69 mm/sec.
Recording time max.:	SP: 30 minutes (with EC-30 cassette) LP: 60 minutes (with EC-30 cassette)
Video signal:	Output Level 1 Vp-p/75 ohm
Audio signal:	Output Level -6 dB/1K ohm Microphone input -68 dB/high impedance Earphone 16 ohm impedance
Image device:	1/2" CCD
Minimum required illumination:	10 lux (.1 fc) (at F1.4)
Illumination range:	10-100,000 lux (.1-9,300 fc)
Lens:	F1.4, f=9-54 mm, 6:1 power zoom lens with auto iris control and macro position, filter diameter 49 mm
High-speed shutter:	1/1000 sec.
Viewfinder:	Electronic viewfinder with 0.6" black/white CRT
White balance adjustment:	Full-auto/preset standard
Operating temperature:	0°C ~ 40°C
Storage temperature:	-20°C ~ 50°C
Weight:	1.2 kg
Dimensions:	117.5(W)x155(H)x258.5(D) mm

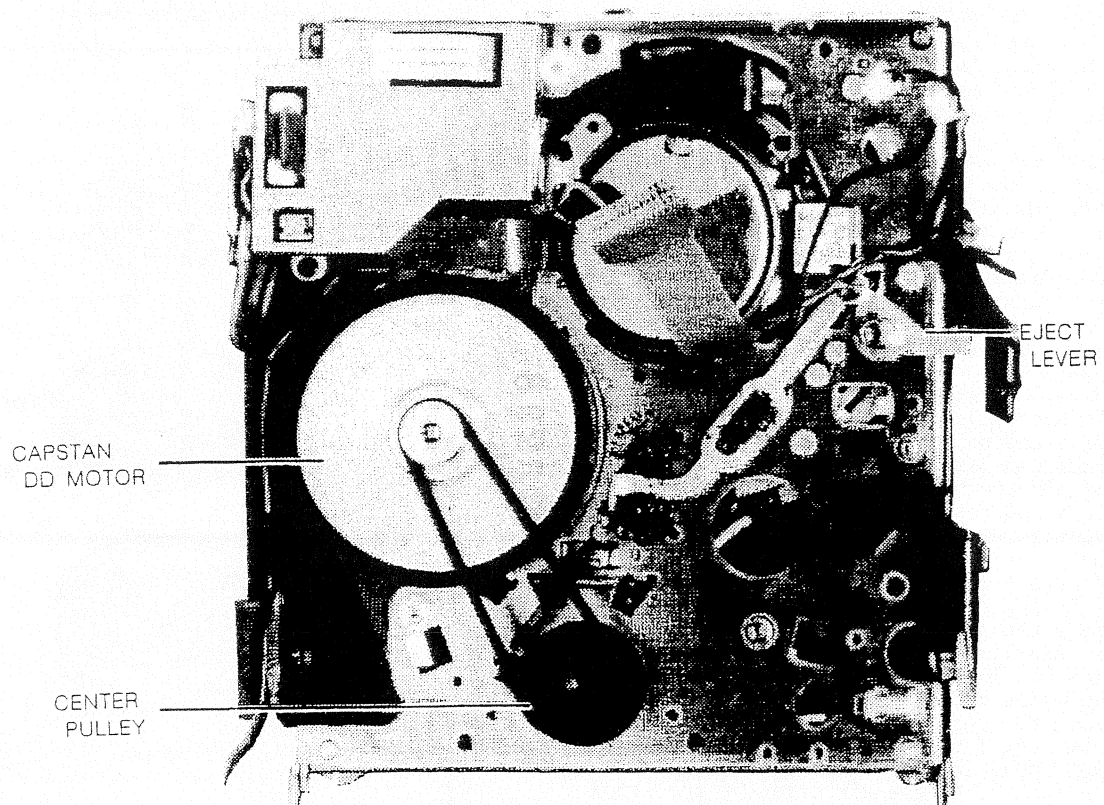
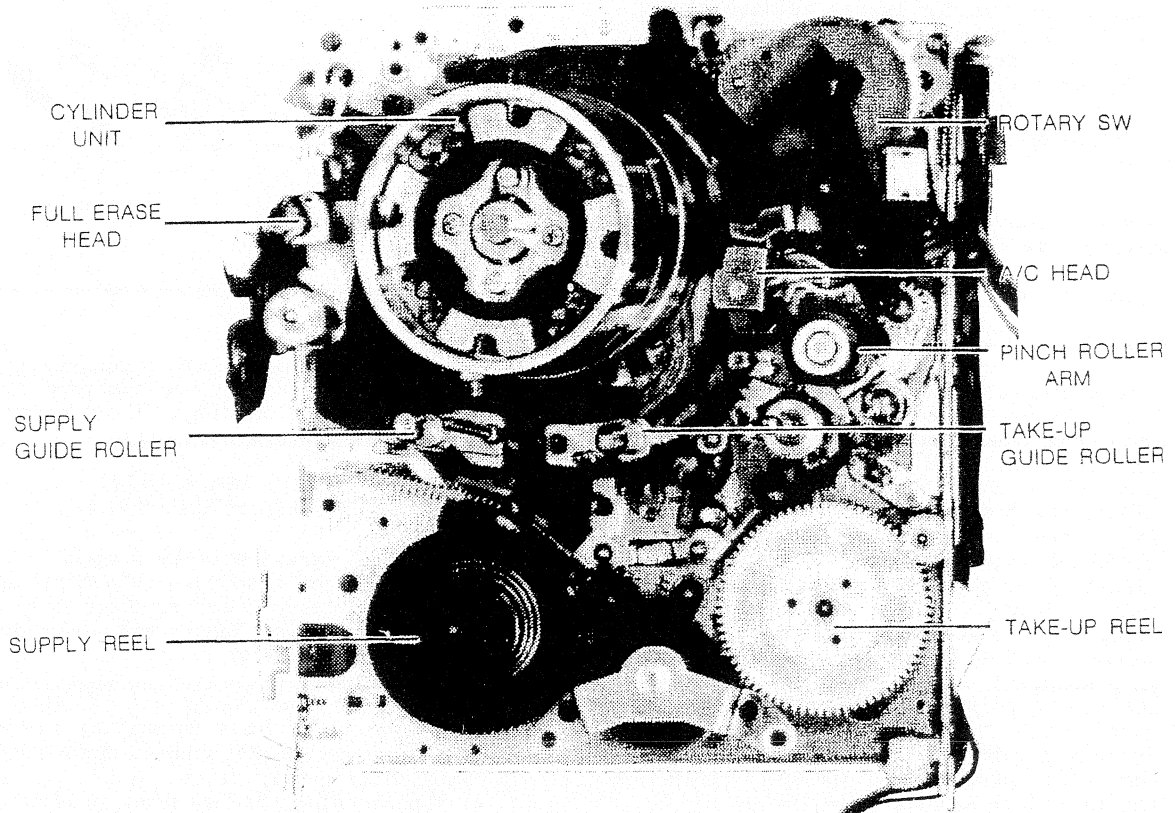
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HQ

This video movie is equipped with HQ (High Quality) recording capability.

DECK PARTS LOCATION



METHODS OF ADJUSTMENT AND REPLACEMENT

BEFORE PROCEEDING

1. This section describes procedures to replace mechanism parts which have aged and been worn as well as for parts replacement resulting from accidental troubles.
2. As most mechanical adjustments have close relation to electrical adjustments, pay enough attention to adjusting the mechanism in consideration of that it is the base of electrical adjustments.

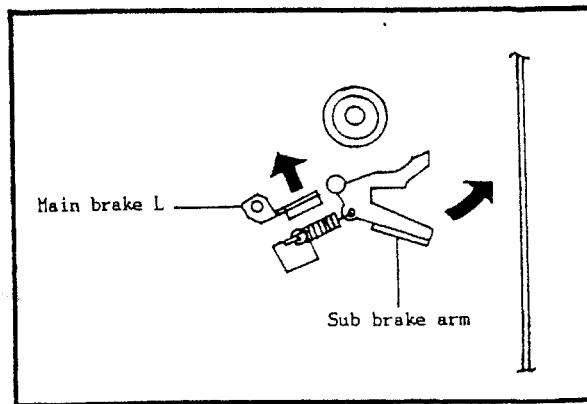
Test equipment required:

Oscilloscope: Wide-band, dual trace,
triggered, delayed sweep.

Alignment tape

DECK PARTS REPLACEMENT

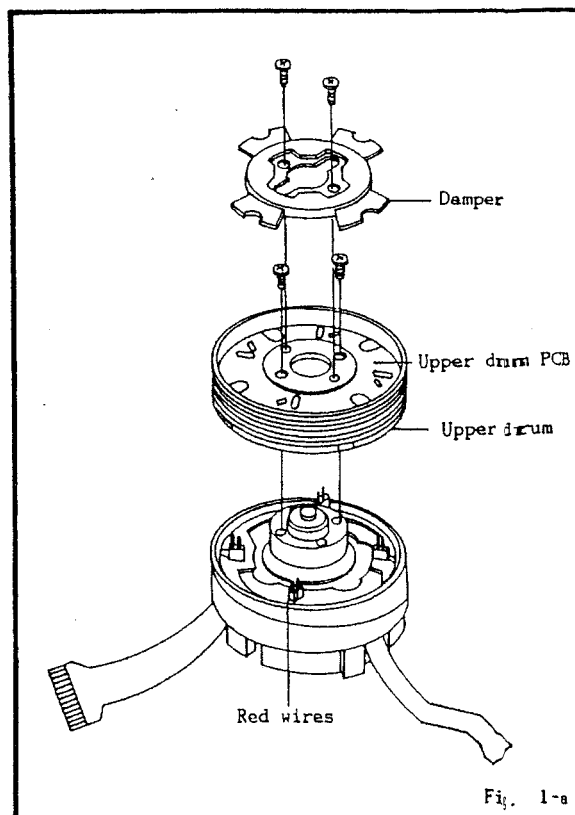
1. Remove the earth lug. (1 screw)
2. Slide the eject lever in the direction of the arrow (Fig. 2-c) and lift the STAGE up. Then pull the STAGE unit in the direction towards you and remove. (2 screws)
3. Remove the rotary switch. (1 screw)
4. Remove the arm lock 2. (2 screws)
5. Slide the lock arm lever and SB rod in the direction of the arrow (Fig. 2-d) and remove the cam gear.
6. Slide the F-S gear in the direction of the arrow (Fig. 2-f) and remove the deck plate. (3 screws)
7. Remove the polyslider washer on the middle post, slide it in the direction of the arrow and remove it. (Fig. 2-f)
8. Remove the pinch roller actuator spring on the main deck and then remove the polyslider washer.
Remove the pinch roller arm from the actuator, then remove the E-ring.
9. Remove the loading motor. (2 screws)
10. Remove the cylinder wire that is on the back of the main deck on the connector of the MDA PCB and separate the cylinder unit. (CAUTION: Do not drop or damage the cylinder unit.)
11. Remove 3 screws.
Remove the motor cover and the belt, then separate the capstan DD motor.
Remove the MDA PCB. (4 screw)
12. Remove the tension servo spring.
Remove the tension servo while lifting up the tension arm.
(The tension lever cap is removed simultaneously)
13. Remove the end sensor holder. (1 screw)
14. Remove the nut and impedance roller and FE head arm.
15. Remove 4 screws.
Lift the UV base and remove it.
16. Remove the polyslider washer that is on the T-inclined base. (3 screws)
Take off the hooks (2 positions) of the T-inclined base, lift it up and then remove it.
17. Remove the holding gear C. (1 screw)
Lift the S-ring gear up and then remove the S-ring from a hook of the holding gear A.
18. Remove the guide gear S (1 polyslider washer) and then lift the guide gear S and remove it.
19. Slide the main brake L. (Fig. 2-b)
Remove the S reel gear. (1 polyslider washer)
20. Remove the center pulley. (2 screws)
21. Remove the T reel gear. (1 polyslider washer)
(CAUTION: Slide the sub brake arm and main brake R in the direction of the arrow. Install or remove the T roller gear.) (See the following figure)



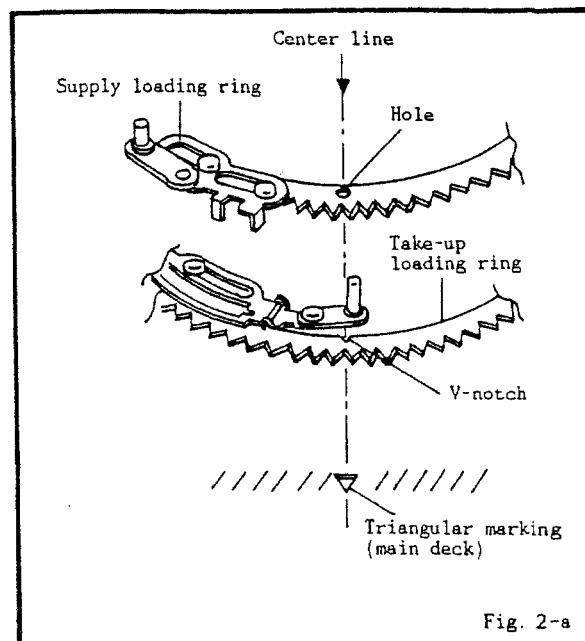
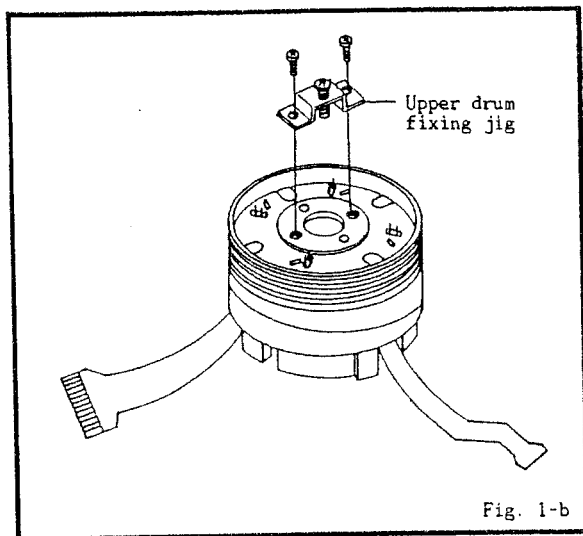
When replacing parts shown below in sections ■A-1 and ■A-2 follow the numbered steps indicated in the heading. These steps are detailed on the previous page.

■A-1: UPPER DRUM REPLACEMENT (DECK PARTS REPLACEMENT NO. ①, ②)

1. Remove 2 screws and the damper.
2. Unsolder the drum pins extending through the upper drum board (8 locations) and take out two screws. Remove the upper drum board. (Refer to Fig. 1-a)
3. If the upper drum is difficult to remove, use the upper drum fixing jig (JG040), see Fig. 1-b. When installing the upper drum preheat the upper drum to approximately 50°C by using a hair dryer.
4. When setting the new drum in place, align the brown colored pins with the red wires of the lower drum, as indicated in Fig. 1-a.
5. After replacing the upper drum, check and adjust the FM waveform (■A-4).



METHODS OF ADJUSTMENT AND REPLACEMENT



■ A-2: CHECKS AND ADJUSTMENTS (DECK PARTS REPLACEMENT NO. ①~⑬, ⑮~⑰)

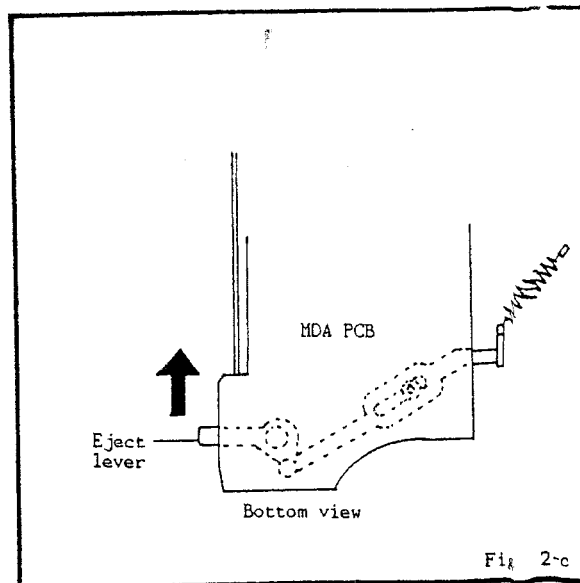
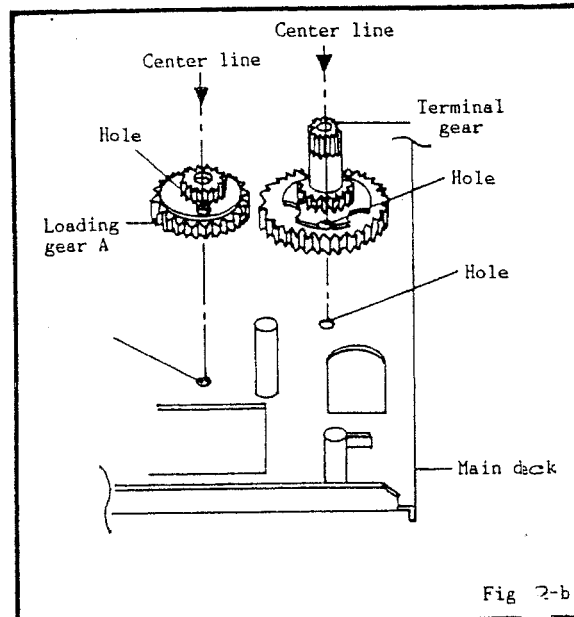
Perform the following position checks after replacing or disturbing the affected parts.

● A-2-1: Loading rings, terminal gear and loading gear A

When replacing or removing the loading rings, first align them at the mechanical Stop mode position as shown in Fig. 2-a.

1. Temporarily remove the worm gear of the loading motor bracket assembly. Turn the take-up and supply loading rings in the unloading direction.
2. As viewed from the top of the deck, adjust so that the hole and V-notch of the rings are positioned above the triangular marking of the main deck. (Refer to Fig. 2-a)
3. Adjust the hole of the terminal gear with the hole of the main deck as indicated in Fig. 2-b. Then adjust the hole of the loading gear A with the hole of the main deck as indicated in Fig. 2-b. When adjusting the loading ring positions, press the eject lever on the rear of the deck toward the reel. (Refer to Fig. 2-c) This eject lever will not function correctly if its position deviates.
4. Adjust the marked position of the cam gear with the center of the terminal gear shaft, as indicated in Fig. 2-d. This is the Stop position.

IMPORTANT: If the adjustment at ● A-2-1 has misaligned slightly, normal functions may not operate. Adjust the alignment at ● A-2-1 more carefully.



METHODS OF ADJUSTMENT AND REPLACEMENT

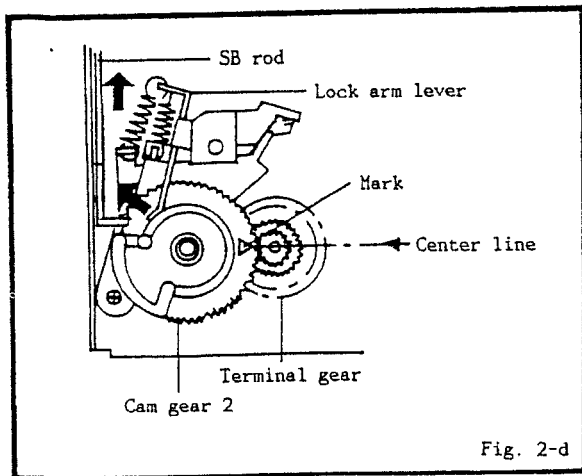


Fig. 2-d

●A-2-2: Rotary switch

In the Stop Mode, the rotary switch setting is as indicated in Fig. 2-e.

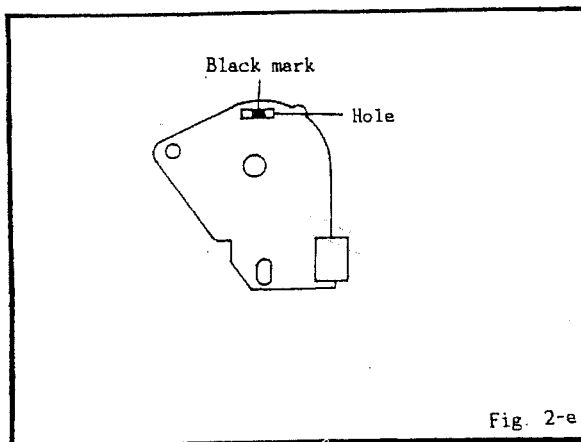


Fig. 2-e

●A-2-3: Middle pole

In the Stop mode, the F-S gear hole and middle pole arm projection are aligned, as indicated in Fig. 2-f.

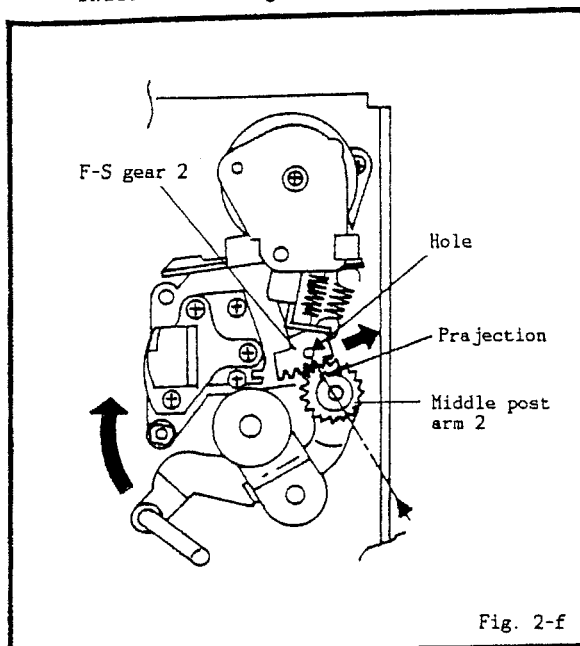


Fig. 2-f

●A-2-4: Back tension

Adjust the back tension torque range from 18~28g.cm with the torque cassette (JG041). (When the back tension torque range changes, it takes the center torque value with it.)

CAUTION: To increase the back tension torque, turn the screw ① clockwise. To decrease the back tension torque, turn the screw ① counter-clockwise. (Refer to Fig. 2-g)

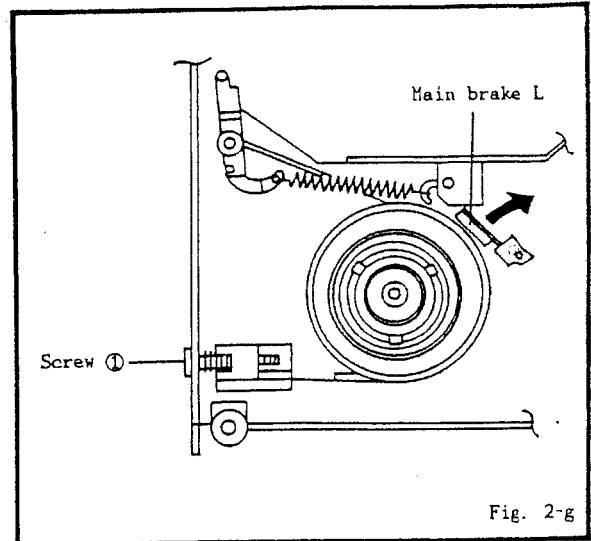


Fig. 2-g

■A-3: TAPE TRANSPORT CHECKS AND ADJUSTMENTS

NOTE: The tape transport has been adjusted at the factory and ordinarily does not require readjustment. After extensive use or if parts affecting the transport have been replaced, perform the following checks and adjustments. Use care not to disturb settings unnecessarily.

●A-3-1: Guide rollers

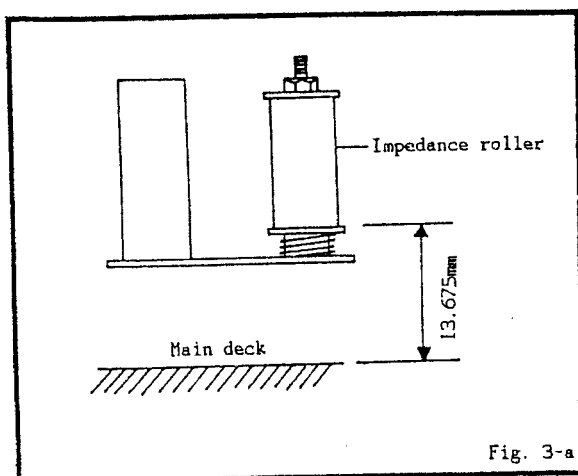
1. Perform these adjustments carefully, since they affect interchangeability.
2. Use a spare cassette (not Alignment tape) and while tape is running, adjust the supply side guide roller height with a metric (1.4 mm) hex. wrench for smooth tape transport at the drum intake and along the drum lead.
3. In the same manner, adjust the take-up guide roller for the output side.

●A-3-2: Impedance rollers

NOTE: Avoid disturbing these settings, since they form the reference for the other transport system adjustments. The nut atop the roller is for securing, not for adjustment.

For reference, the supply side relationships are indicated in Fig. 3-a.

METHODS OF ADJUSTMENT AND REPLACEMENT

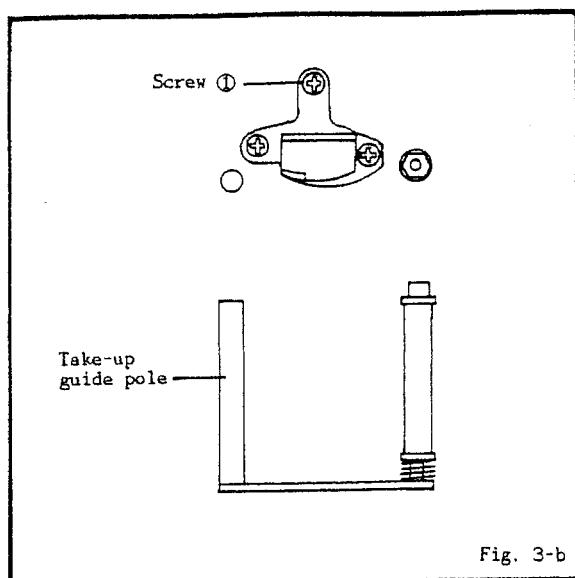


● A-3-3: Audio/control head (Take-up guide poles)

NOTE: Proper adjustment of the audio/control head is essential for interchangeability.

1. After adjusting the take-up guide roller, refer to Fig. 3-b and use a cross-head screwdriver to adjust the audio/control head inclination with the screw ①. Adjust for smooth transport at the take-up guide pole flange.
2. One method of adjusting is to first turn the screw ① counterclockwise to where tape wrinkling occurs at the bottom of the take-up guide pole. Then carefully turn the screw clockwise to eliminate wrinkling.
3. Audio/control head azimuth and height are adjusted as part of the interchangeability adjustment steps.

IMPORTANT: Do not disturb the settings of the take-up guide poles. These have been precision adjusted at the factory.



■ A-4: INTERCHANGEABILITY CHECKS AND ADJUSTMENTS

IMPORTANT: Before using costly alignment tape, first use a spare cassette and confirm proper transport motion without damage to the tape.

● A-4-1: FM waveform

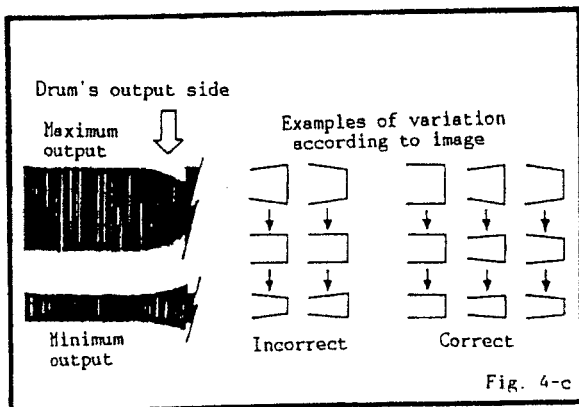
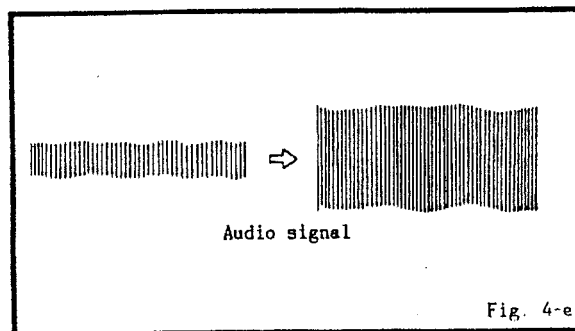
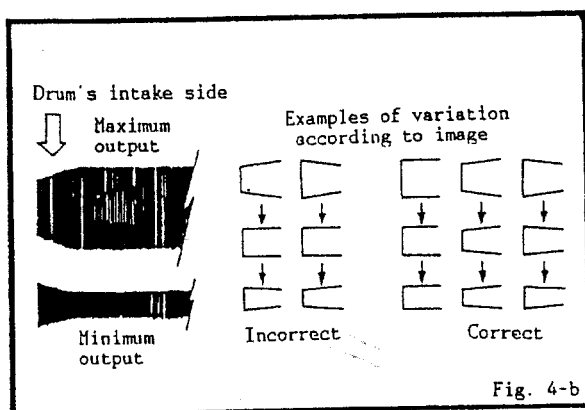
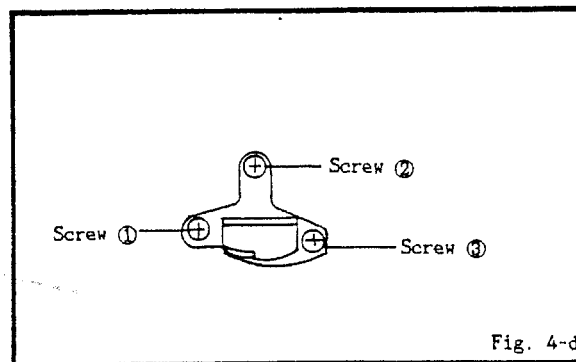
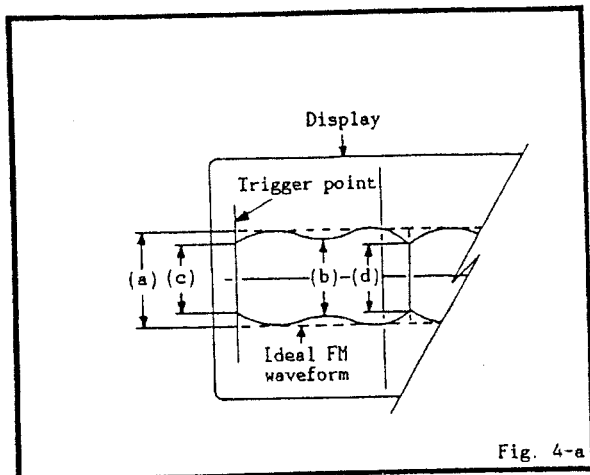
Use the staircase signal of alignment tape (JG042) to check and adjust the FM signal.

1. Play the staircase signal of the alignment tape (JG042) and adjust the TRACKING control for maximum FM waveform. Refer to Fig. 4-a and confirm the relationships for the maximum output (a), minimum output at waveform center (b), minimum output at drum intake (c) and minimum output at drum output (d).
2. In addition to meeting the above specifications, overall variation of the tracking may cause large drops in level or increase noise.
3. Operate the TRACKING control to vary the FM waveform from maximum to minimum, and from minimum to maximum. Confirm that the waveform varies evenly at the drum intake portion. As illustrated in Fig. 4-b, if the slope varies from outward to inward, or from inward to outward, the supply guide roller height adjustment is incorrect. Adjust the height so that the tape travels properly in the drum lead and the waveform variation becomes nearly parallel.
4. Similarly, observe the variation at the drum output portion. Adjust the take-up guide roller height for parallel waveform variation. (Refer to Fig. 4-c)
5. Operate the TRACKING control and observe variation of the overall FM waveform. Fine adjust the supply and take-up guide poles so that variation is parallel and linear.
6. Confirm absence of tape wrinkling or curling at the impedance rollers and take-up guide pole. If curling or wrinkling is observed at the supply side impedance roller, carefully fine-adjust (lower) the impedance roller. If curling or wrinkling is observed at the take-up guide pole, readjust the audio/control head inclination for smooth tape travel at the lower flange of the guide pole. Afterwards, check the FM waveform again.

$$\frac{b}{a} \geq 0.8 \quad \frac{c}{a} \geq 0.7 \quad \frac{d}{a} \geq 0.7$$

(Video FM waveform specifications)

METHODS OF ADJUSTMENT AND REPLACEMENT



●A-4-2: Audio/control head

Since this is a record-only unit, all tapes made with this unit are played back on another deck. Therefore, the audio/control head must be correctly adjusted in order to ensure adequate audio output and S/N, in addition to correct pick up of the control signal for servo operation.

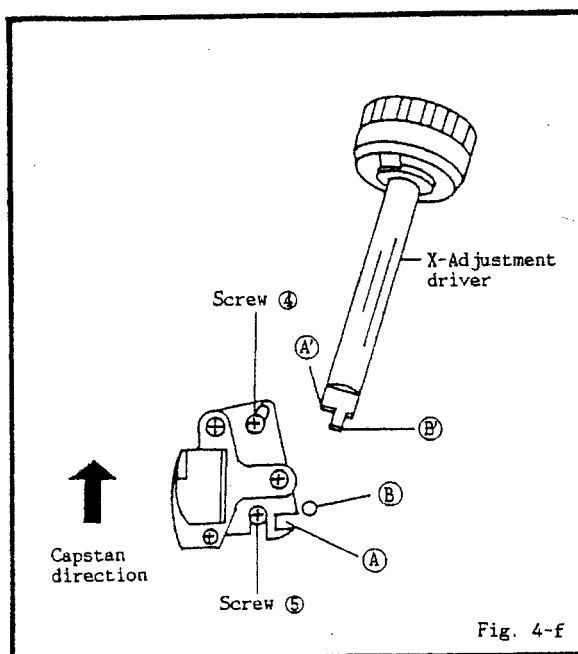
1. Play staircase (audio 6 KHz) section of the alignment tape (JG042).
2. Refer to Fig. 4-d. Turn the screw ③ for maximum audio output.
3. Turn the screws ①, ② and ③ by small (about 45°) and equal increments to adjust the head height for maximum audio output. (Refer to Fig. 4-e)

●A-4-3: Control head phase (X value)

This affects the playback synchronization between sound and picture. It is more delicate in the LP mode than the SP mode.

1. Play the staircase signal of the alignment tape (JG042).
2. Slightly loosen the screws ④ and ⑤ of the audio/control head. Insert prong (B) of the X-adjustment driver (JG044) into the hole (B) and the other prong (A) into the notch (A). Then twist to shift the head fully toward the capstan direction.
3. While observing the CH-1 FM waveform, carefully shift the head in the opposite direction to capstan direction (Refer to the arrow in the Fig. 4-f) and position. Set to the maximum peak. Then tighten screws ④ and ⑤.
4. Check again for maximum FM waveform.

METHODS OF ADJUSTMENT AND REPLACEMENT



FINAL CHECKS

1. Record a signal and confirm that playback FM waveform meets the criteria of Fig. 4-a.
2. Perform checks and adjustments as described in the Electrical Adjustments Section.

ELECTRICAL ADJUSTMENTS

DECK SECTION

PREPARATION

Electrical adjustments are generally necessary after replacing worn mechanical parts or video heads because of interrelationship between those parts and various electrical circuits. In the event of electrical malfunction, first troubleshoot with the aid of proper test instruments, and then, commence necessary repair, replacement, and adjustment, etc.

Test instruments

- Oscilloscope
- Spectrum analyzer
- DC power supply
- DC voltmeter
- AC voltmeter
- Character generator

■ E-1: BATTERY ALARM

CONDITIONS

MODE - POWER ON
STOP

INSTRUCTIONS

- (1) Connect the DC power supply (9.6V) to ① pin of CP1201.
- (2) Connect CH-1 on the oscilloscope to TP1003 and, turn VR1001 clockwise in case of high level(DC 5V) and turn counter-clockwise in case of low level(DC 0V).
- (3) Adjust voltage to high level with VR1001 at the point where high level is changed to low level is changed to high level.
- (4) Next, check if "BATTERY" appears in the monitor.

■ E-2, 3: NOT REQUIRED FOR THIS MODEL

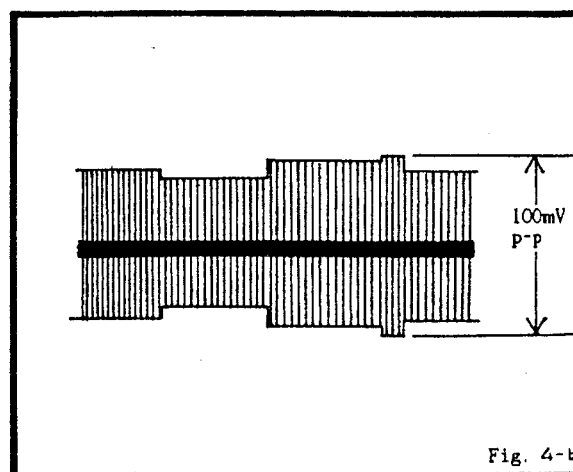
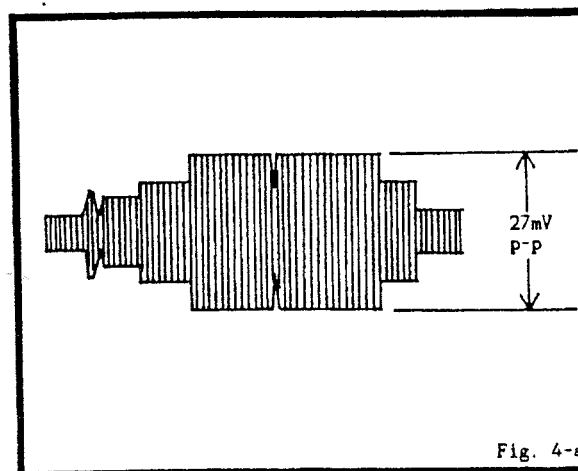
■ E-4: RECORD CURRENT

CONDITIONS

MODE - RECORD
Input signal - Color bar

INSTRUCTIONS

- (1) Connect CH-1 on the oscilloscope to TP4101 and CH-2 to TP4006. Connect TP4004 to GND.
- (2) Adjust VR3001 so that the cyan level becomes $27 \pm 2\text{mVp-p}$ as shown in Fig. 4-a.
- (3) Adjust VR4005 so that the horizontal sync. level becomes $100 \pm 5\text{mVp-p}$ as shown in Fig. 4-b.



■ E-5, 6: NOT REQUIRED FOR THIS MODEL

■ E-7: PB. SWITCHING POSITION.

CONDITIONS

MODE - PLAYBACK
Input signal - Standard test tape

NOTE: Tracking control should be set at click point.

INSTRUCTIONS

- (1) Connect CH-1 on the oscilloscope to TP2001 and connect CH-2 on the oscilloscope to TP4202.
- (2) Adjust VR2001 so that the waveform of the oscilloscope measures $6.5 \pm 0.5(\text{H})$ at both leading and trailing edges as shown in Fig. 7.

ELECTRICAL ADJUSTMENTS

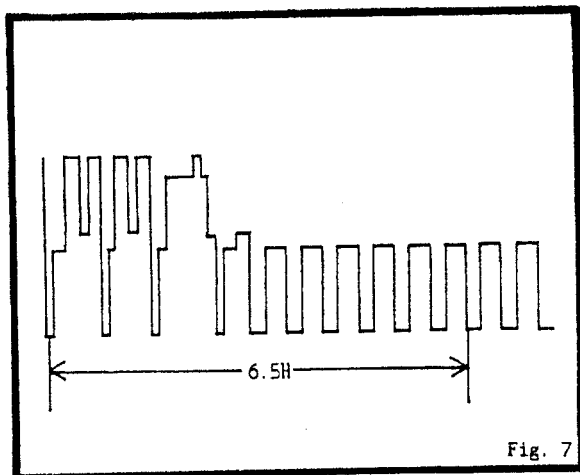


Fig. 7

■ E-8: TRACKING FIX

CONDITIONS

MODE - PLAYBACK

Input signal - Standard test tape

NOTE: Tracking control should be set at click point.

INSTRUCTIONS

- (1) Connect CH-1 on the oscilloscope to TP2001 and connect CH-2 on the oscilloscope to TP2005.
- (2) Adjust VR2003 so that the "T" portion measures $0.45 \pm 0.1 \text{msec}$ as shown in Fig. 8.

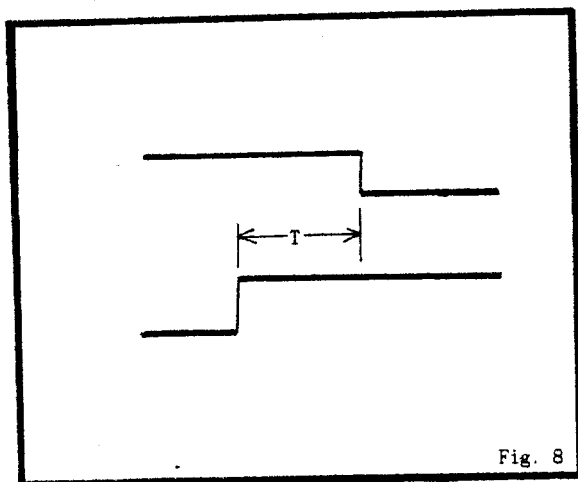


Fig. 8

■ E-9: POWER CONTROL 8V

CONDITIONS

MODE - RECORD

Input signal - Color bar

INSTRUCTIONS

- (1) Connect the DC voltmeter to TP2501 and TP2502. (GND)
- (2) Adjust the voltage to $8.0 \pm 0.1 \text{V}$ with VR2502.

■ E-10: POWER CONTROL 5V

CONDITIONS

MODE - RECORD

Input signal - Color bar

INSTRUCTIONS

- (1) Connect the DC voltmeter to TP2501 and TP2502. (GND)
- (2) Adjust the voltage to $5.0 \pm 0.1 \text{V}$ with VR2501

■ E-11: AUDIO BIAS CURRENT

CONDITIONS

MODE - RECORD

Input signal - No signal

INSTRUCTIONS

- (1) Connect the AC voltmeter to TP5001 and TP5002 (GND).
- (2) Adjust the voltage to $2.8 \pm 0.1 \text{mVrms}$ with VR5001.

■ E-12: AUDIO PLAYBACK LEVEL

CONDITIONS

MODE - Self (RECORD and PLAYBACK)
SP MODE

Input signal - Color bar

INSTRUCTIONS

- (1) Connect the AC voltmeter to J4202 @ pin.
- (2) Adjust VR5002 so that the playback output may become $400 \pm 20 \text{mVrms}$.

■ E-13: CHARACTER GENERATOR HORIZONTAL POSITION

CONDITIONS

MODE - STOP

Input signal - Monochrome pattern.

INSTRUCTIONS

- (1) Adjust letter "TAPE" in the character generator to center position in the portion 'T' as shown in Fig. 13 with TC4201.

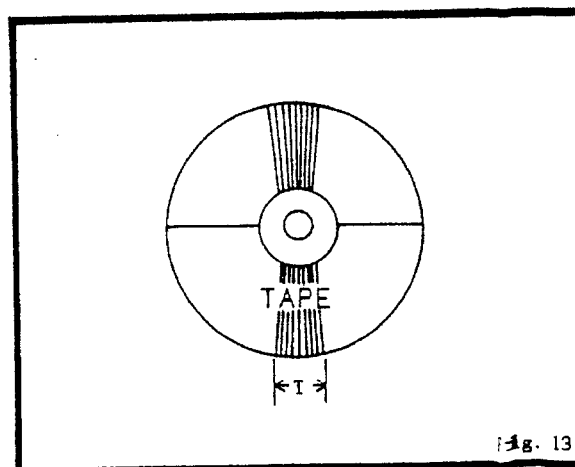


Fig. 13

ELECTRICAL ADJUSTMENTS

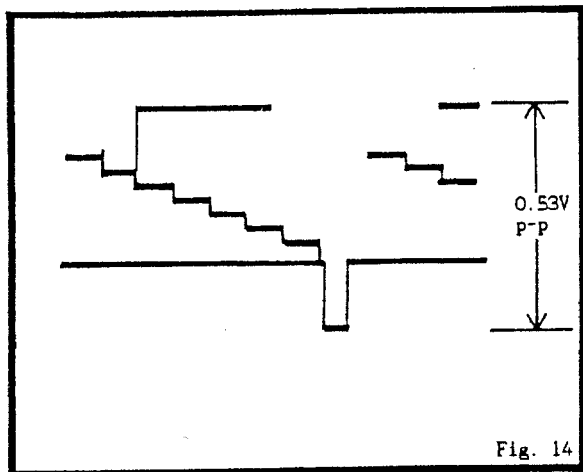
■ E-14: E-E LEVEL

CONDITIONS

MODE - RECORD
Input signal - Color bar

INSTRUCTIONS

- (1) Connect the oscilloscope to TP4005.
- (2) Adjust VR4004 so that the waveform measures $0.53 \pm 0.01\text{Vp-p}$ as shown in Fig. 14.



■ E-15: CARRIER AND DEVIATION

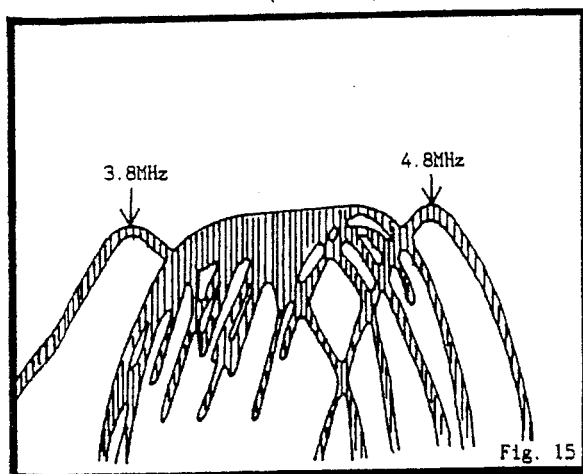
CONDITIONS

MODE - RECORD
Input signal - Color bar

INSTRUCTIONS

- (1) Connect TP4004 to the input terminal on the spectrum analyzer, then adjust 3.8MHz and 4.8MHz as shown in Fig. 15 with VR4001 and VR4002.

VR4001 (DEVIATION)
VR4002 (CARRIER)



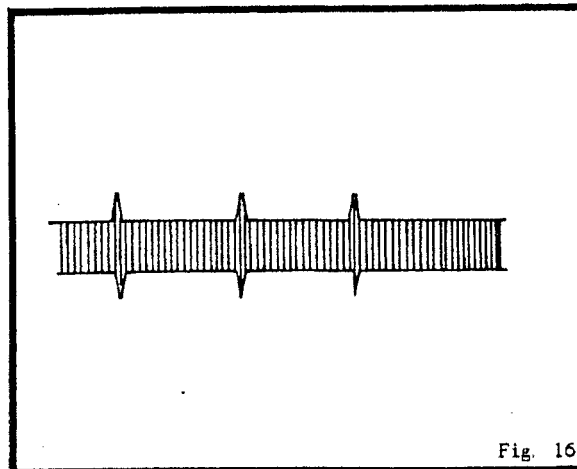
■ E-16: NOISE CANCEL

CONDITION

MODE - PLAYBACK
Input signal - Color bar test tape

INSTRUCTIONS

- (1) Connect CH-1 of the oscilloscope to TP4002 and CH-2 on the oscilloscope to TP4003.
- (2) Adjust the VR4006 so that the waveform of CH-1 is straight as shown in Fig. 16.



■ E-17: PLAYBACK LUMINANCE LEVEL

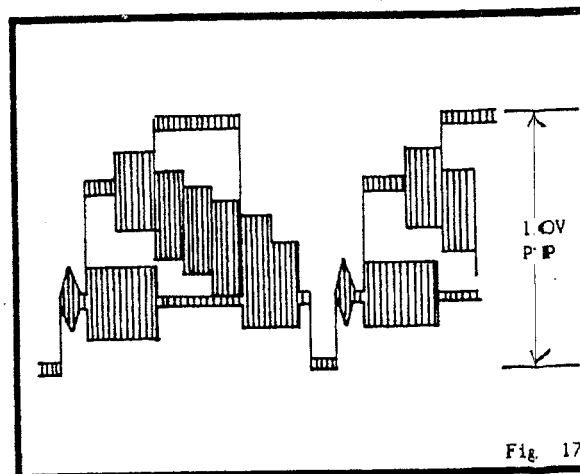
CONDITIONS

MODE - PLAYBACK
Input signal - Color bar test tape

NOTE: Video out of the unit should be terminated with 75 ohm load.

INSTRUCTIONS

- (1) Connect the oscilloscope to TP4202.
- (2) Adjust VR4003 so that the signal becomes $1.0 \pm 0.05\text{V}$ as shown in Fig. 17.



■ E-18: OSC. FREQUENCY

INSTRUCTIONS

1. Connect the frequency counter to part "a" on the condenser C504.
2. Adjust the frequency to $117.5 \pm 1\text{KHz}$ with VR501.

ELECTRICAL ADJUSTMENTS

CAMERA SECTION

Test instruments

- Frequency counter
- Oscilloscope(dual trace)
- Vectorscope
- Color monitor
- Color viewer
- Collimeter

■ E-1: CLOCK FREQUENCY

INSTRUCTIONS

1. Connect the frequency counter to TP7001.
2. Adjust the frequency to 9656250 ± 25 Hz with TC7001.

■ E-2: BLOOMING

CONDITION

Test chart - Grey scale pattern (JG051)

INSTRUCTIONS

1. Pick up a grey scale pattern.
2. Load 2 pin on the connector (4 pin) for the iris motor with 5V and 4 pin to GND and then open the iris.
3. Set the "zoom" to "tele" position and take square in the middle of the grey scale.
4. Adjust VR7001 so that blooming is lost in the square in the middle of the grey scale.

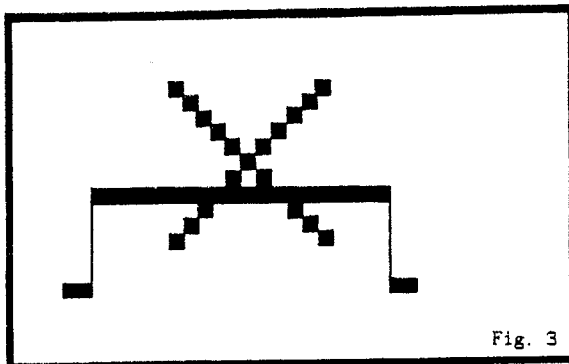
■ E-3: YH BALANCE

CONDITION

Test chart - Grey scale pattern (JG051)

INSTRUCTIONS

1. Pick up a grey scale pattern.
2. Connect the oscilloscope to TP8006 and TP8003. (GND)
3. Adjust VR8001 for the waveform indicated in Fig. 3.



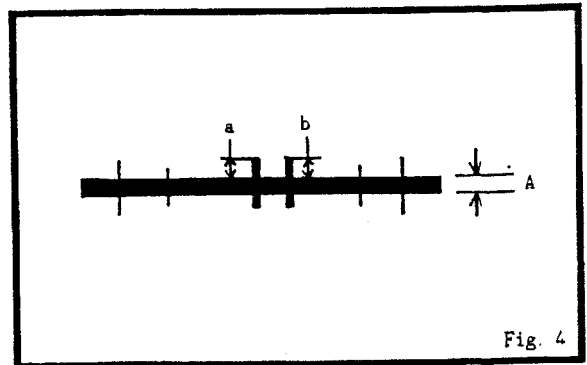
■ E-4: V.EDGE BALANCE

CONDITION

Test chart - Grey scale pattern (JG051)

INSTRUCTIONS

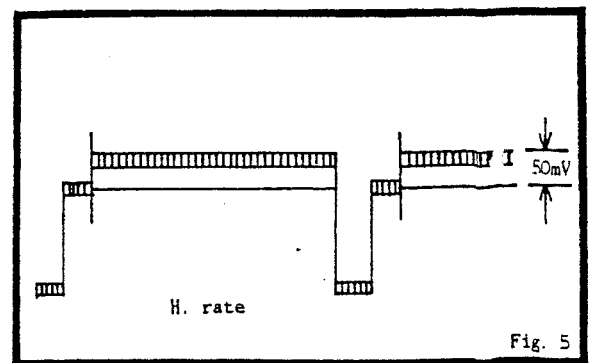
1. Pick up a grey scale pattern.
2. Connect the oscilloscope to TP8001 and TP8003. (GND)
3. Adjust VR8002 so that the waveform for "A" becomes minimum.
Next, adjust VR8003 so that the level for part "a" in the waveform is as same as part "b" in the waveform. (Refer to Fig. 4)
5. Repeat the above adjustment to be the same level at "a" and "b", and to be minimum for "A".



■ E-5: YH SET UP

INSTRUCTIONS

1. Connect the oscilloscope to pin ④ CP4204.
2. Cover the lens with the cap.
3. Adjust VR7006 for the waveform indicated in Fig. 5.



ELECTRICAL ADJUSTMENTS

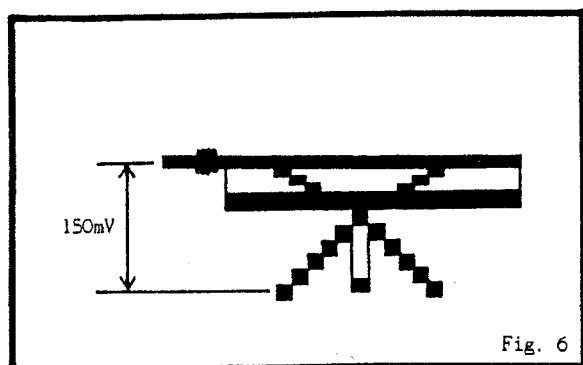
■ E-6: YH GAIN

CONDITION

Test chart - Grey scale pattern (JG051)

INSTRUCTIONS

1. Pick up a grey scale pattern.
2. Take gray scale pattern in the full of picture.
3. Connect the oscilloscope to TP7004 and TP7008. (GND)
4. Adjust VR8014 for the waveform indicated in Fig. 6-a.
5. Connect the oscilloscope to pin ④ CP4204.
6. Adjust VR8004 for the waveform indicated in Fig. 6-b.



■ E-7: AGC LEVEL

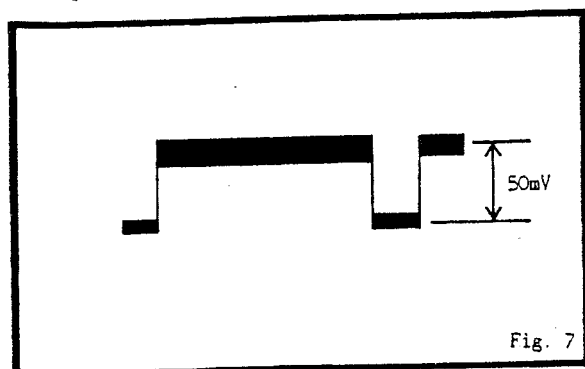
INSTRUCTIONS

1. Cover the lens with the cap.
2. Connect the DC voltmeter to TP7005.
3. Adjust the voltage to $1.0 \pm 0.02V$ with VR7011.

■ E-8: YL SET UP

INSTRUCTIONS

1. Connect the oscilloscope to TP7003.
3. Cover the lens with the cap.
4. Adjust VR7004 for the waveform indicated in Fig. 8.



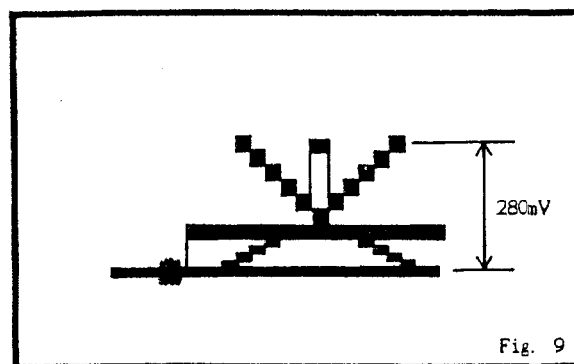
■ E-9: YL LEVEL

CONDITION

Test chart - Grey scale pattern (JG051)

INSTRUCTIONS

1. Pick up a grey scale pattern.
2. Take gray scale pattern in the full of picture.
3. Connect the oscilloscope to TP7002 and TP7008. (GND)
4. Adjust VR7005 for the waveform indicated in Fig. 9



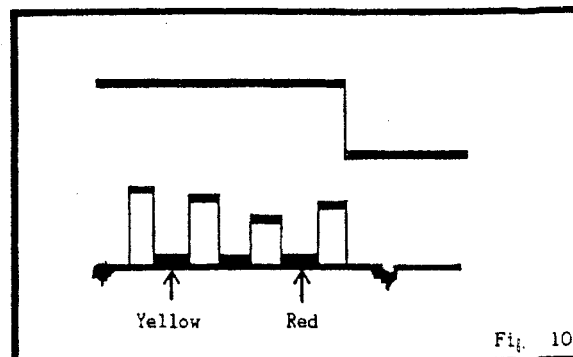
■ E-10: R/B SEPARATION

CONDITION

Test chart - Color bar pattern (JG052)

INSTRUCTIONS

1. Pick up a color bar pattern.
2. Cover the lens with the filter (JG048).
3. Connect the oscilloscope to TP7006 and TP7008. (GND)
4. Adjust VR7009 so that the level at yellow is as same as the level at red. (Refer to Fig. 10)
5. Connect the vectorscope to pin ① J4202.
6. Adjust VR7010 so that the level at yellow is as same as the level at blue.



ELECTRICAL ADJUSTMENTS

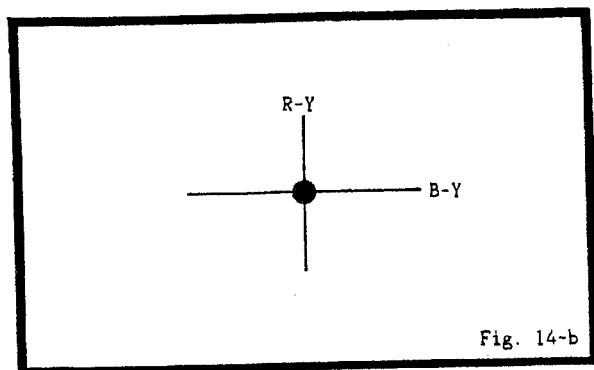


Fig. 14-b

■ E-15: BURST PHASE

CONDITION

Test chart - Grey scale pattern (JG052)

INSTRUCTIONS

1. Pick up a grey scale pattern.
2. Connect the vectorscope to pin ④ CP4202.
3. Adjust VR8011 for the vectorscope waveform to be as indicated Fig. 15.

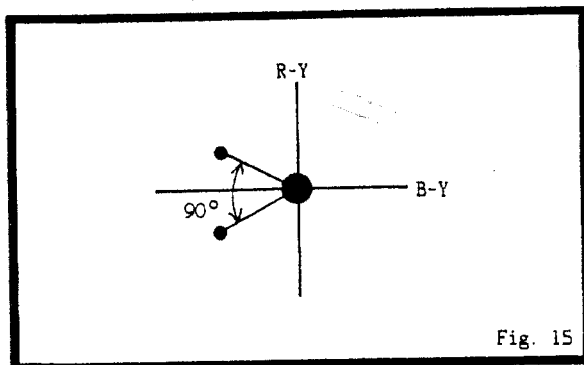


Fig. 15

■ E-16: BURST LEVEL

CONDITION

Test chart - Color bar pattern (JG052)

INSTRUCTIONS

1. Pick up a color bar pattern.
2. Connect the oscilloscope to pin ④ CP4202.
3. Adjust VR8012 for the waveform indicated Fig. 16.

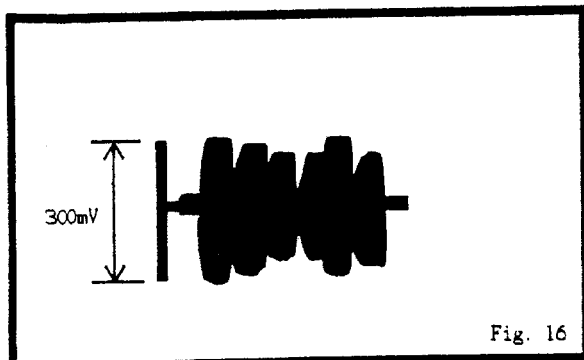


Fig. 16

■ E-17: B-Y GAIN

CONDITIONS

Test chart - Color bar pattern (JG052)

INSTRUCTIONS

1. Pick up a color bar pattern.
2. Cover the lens with the filter (JG048).
3. Connect the vectorscope to pin ④ CP4202.
4. Adjust VR8005 so that the angle between red and yellow becomes 137°. (Refer to Fig. 17)

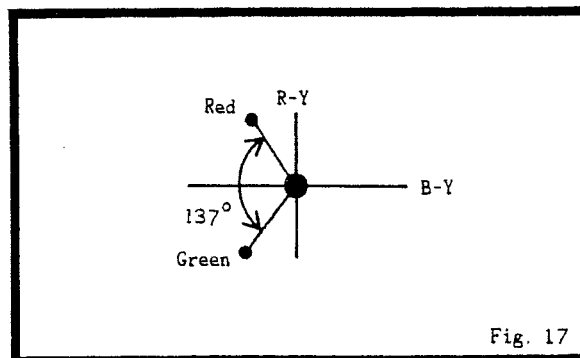


Fig. 17

■ E-18: CHROMA GAIN

CONDITIONS

Test chart - Color bar pattern (JG052)

INSTRUCTIONS

1. Pick up a color bar pattern.
2. Cover the lens with the filter (JG048).
3. Connect the oscilloscope to pin ④ CP4202.
4. Adjust VR8013 for $500 \pm 10\text{mV}$ in the level of red. (Refer to Fig. 18)

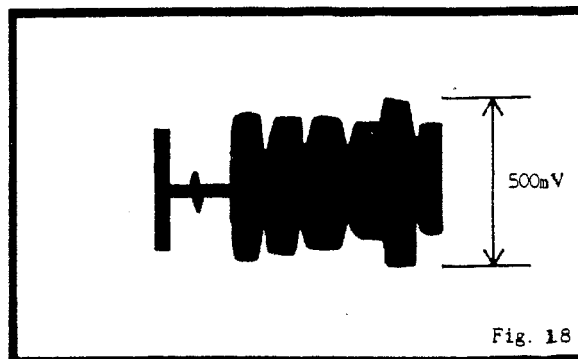


Fig. 18

ELECTRICAL ADJUSTMENTS

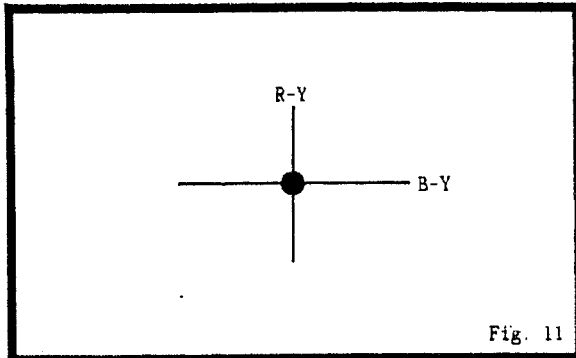
■ E-11: CHROMA OFFSET

CONDITION

Vectorscope - PAL mode

INSTRUCTIONS

1. Cover the lens with the cap.
2. Connect TP7011 and TP7012 to GND.
3. Connect the vectorscope to pin ④ CP4204.
4. Adjust VR8006 so that lighting point is collected in the center of the vectorscope.



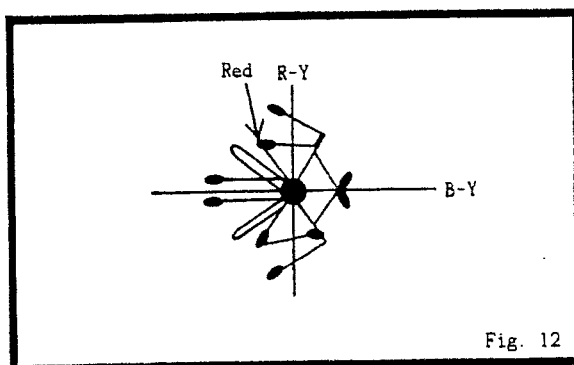
■ E-12: COLOR DIFFERENCE

CONDITION

Test chart - Color bar pattern (JG052)

INSTRUCTIONS

1. Pick up a color bar pattern.
2. Cover the lens with the filter (JG052).
3. Connect the vectorscope to pin ④ CP4204.
4. Adjust VR8015 so that lighting point is collected in the center of the vectorscope. (Refer to Fig. 12)



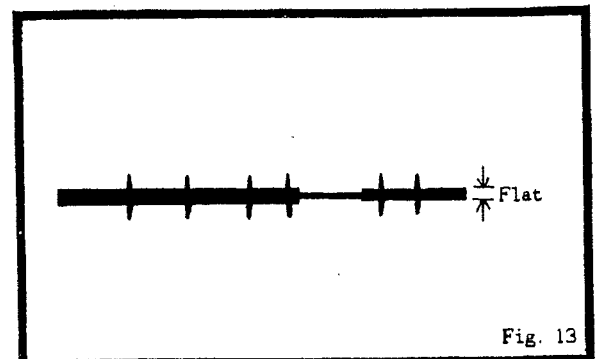
■ E-13: COLOR DIFFERENCE

CONDITION

Test chart - Color bar pattern (JG052)

INSTRUCTIONS

1. Pick up a color bar pattern.
2. Cover the lens with the filter (JG048).
3. Connect the oscilloscope to TP8002 and TP8003. (GND)
4. Adjust VR8016 so that the waveform becomes flat. (Refer to Fig. 13)



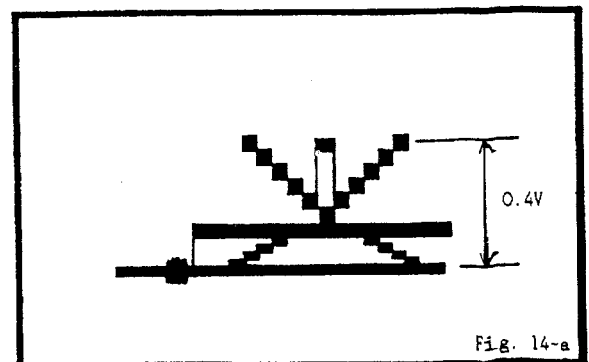
■ E-14: CHROMA SET UP

CONDITION

Test chart - Grey scale pattern (JG052)

INSTRUCTIONS

1. Pick up a grey scale pattern.
2. Cover the lens with the filter (JG048).
3. Connect the DC supplier to pin ⑫ IC8007.
4. Adjust VR7003 for the waveform indicated in Fig. 14-a.
5. Connect the vectorscope to pin ④ CP4204.
6. Adjust VR7002 and VR7003 so that lighting point is collected in the center of the vectorscope. (Refer to Fig. 14-b)
7. Disconnect the DC supplier and collect lighting point in the center of the vectorscope with VR7007 and VR7008.
8. Repeat the above adjustment to collect lighting point in the center of the vectorscope in both the case of 6, 7.



ELECTRICAL ADJUSTMENTS

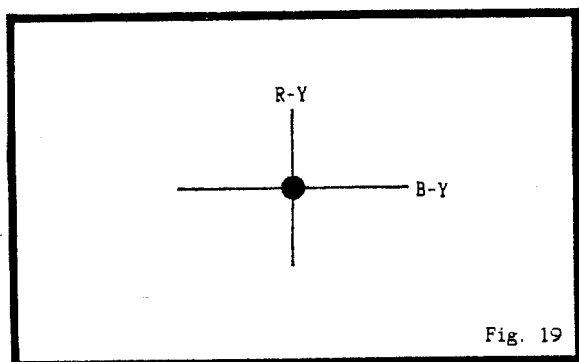
■ E-19: OUTDOOR PRESET

CONDITIONS

Test chart - None (white pattern)
White balance select sw - Outdoor position

INSTRUCTIONS

1. Pick up a white pattern.
2. Connect the vectorscope to pin ④ CP4202.
3. Cover the lens with the filter (JG048A).
4. Adjust VR8007 and VR8009 so that lighting point is collected in the center of the vectorscope. (Refer to Fig. 19)



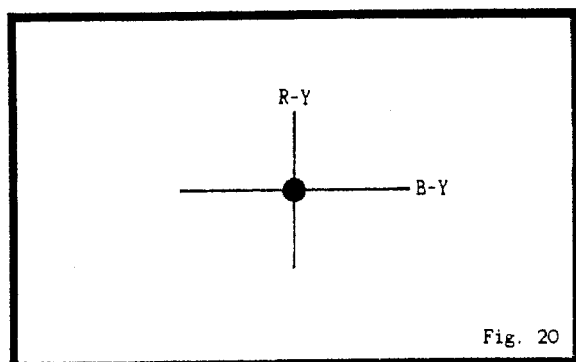
■ E-20: INDOOR PRESET

CONDITIONS

Test chart - None (white pattern)
White balance select sw - Indoor position

INSTRUCTIONS

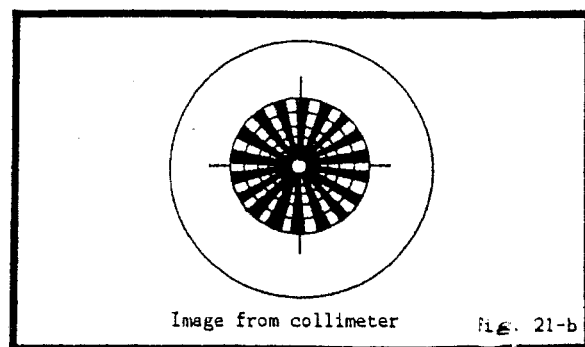
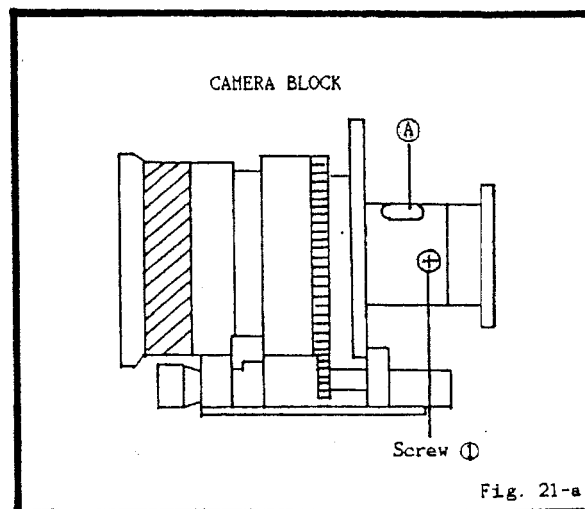
1. Pick up a white pattern.
2. Connect the vectorscope to pin ④ CP4202.
3. Cover the lens with the filter (JG048A).
4. Adjust VR8008 and VR8010 so that lighting point is collected in the center of the vectorscope. (Refer to Fig. 19)



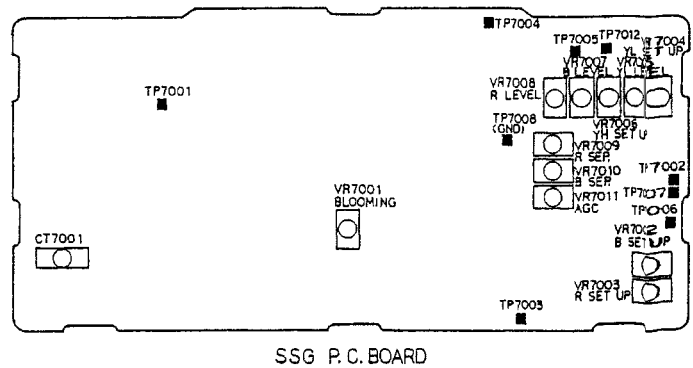
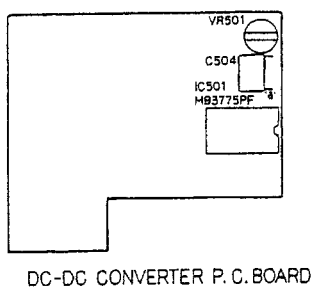
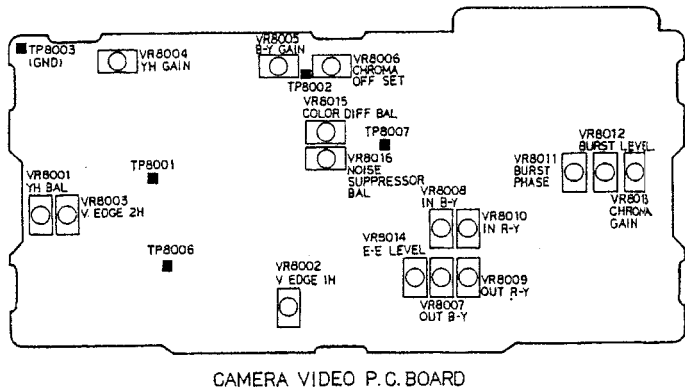
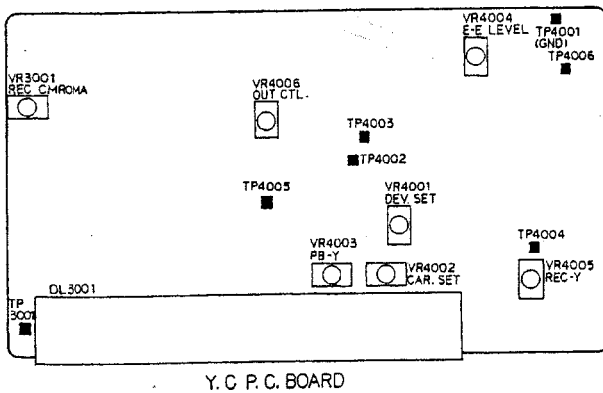
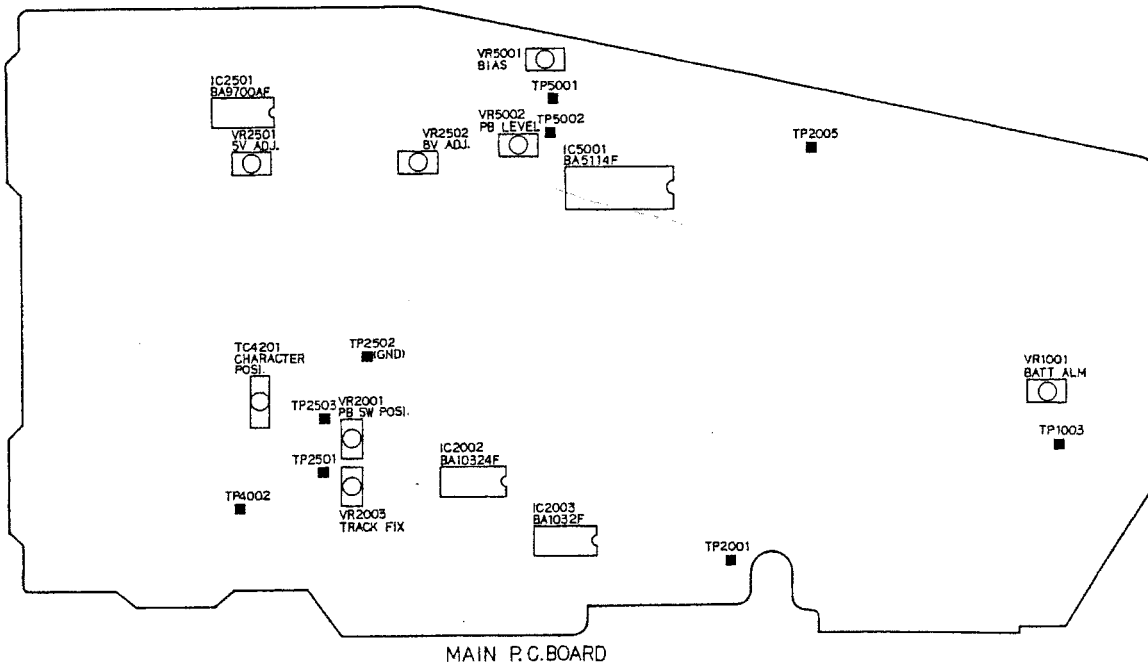
■ E-21: BACK FOCUS

INSTRUCTIONS

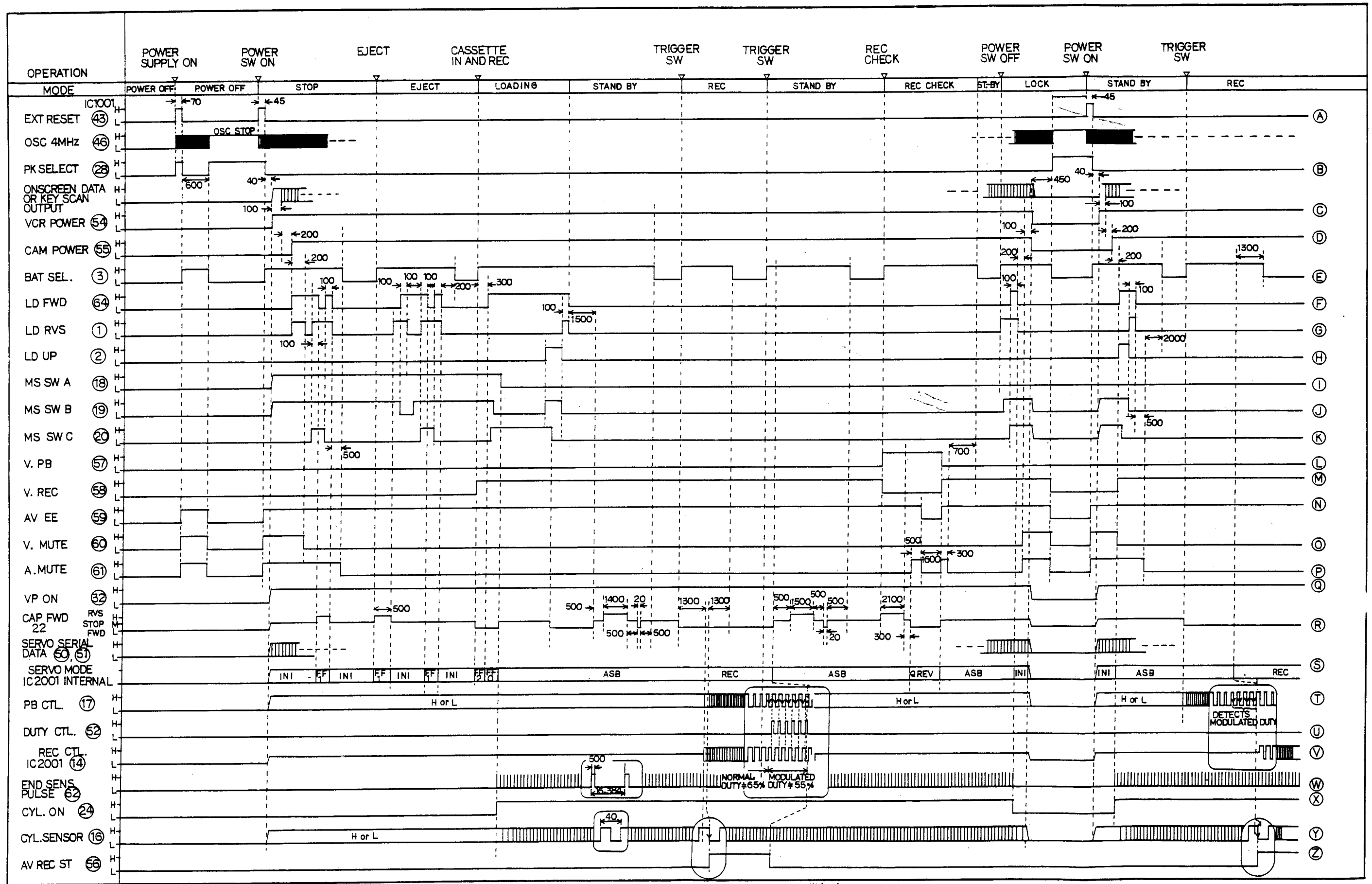
1. Set the AUTO FOCUS SW to MANUAL position. (Set the focus to ∞ position.)
2. Cover the lens with the ND filter (JG049).
3. Set the "zoom" to "wide-angle" position.
4. Loosen the screw ①.
5. Using a collimeter adjust the point A with the back focus adjustment driver (JG046) until the best picture of Fig. 21-b appears.
6. After the above adjustment, tighten the screw ① and recheck the focus. (Refer to Fig. 21-a)



MAJOR COMPONENTS LOCATION GUIDE



TIMING CHART

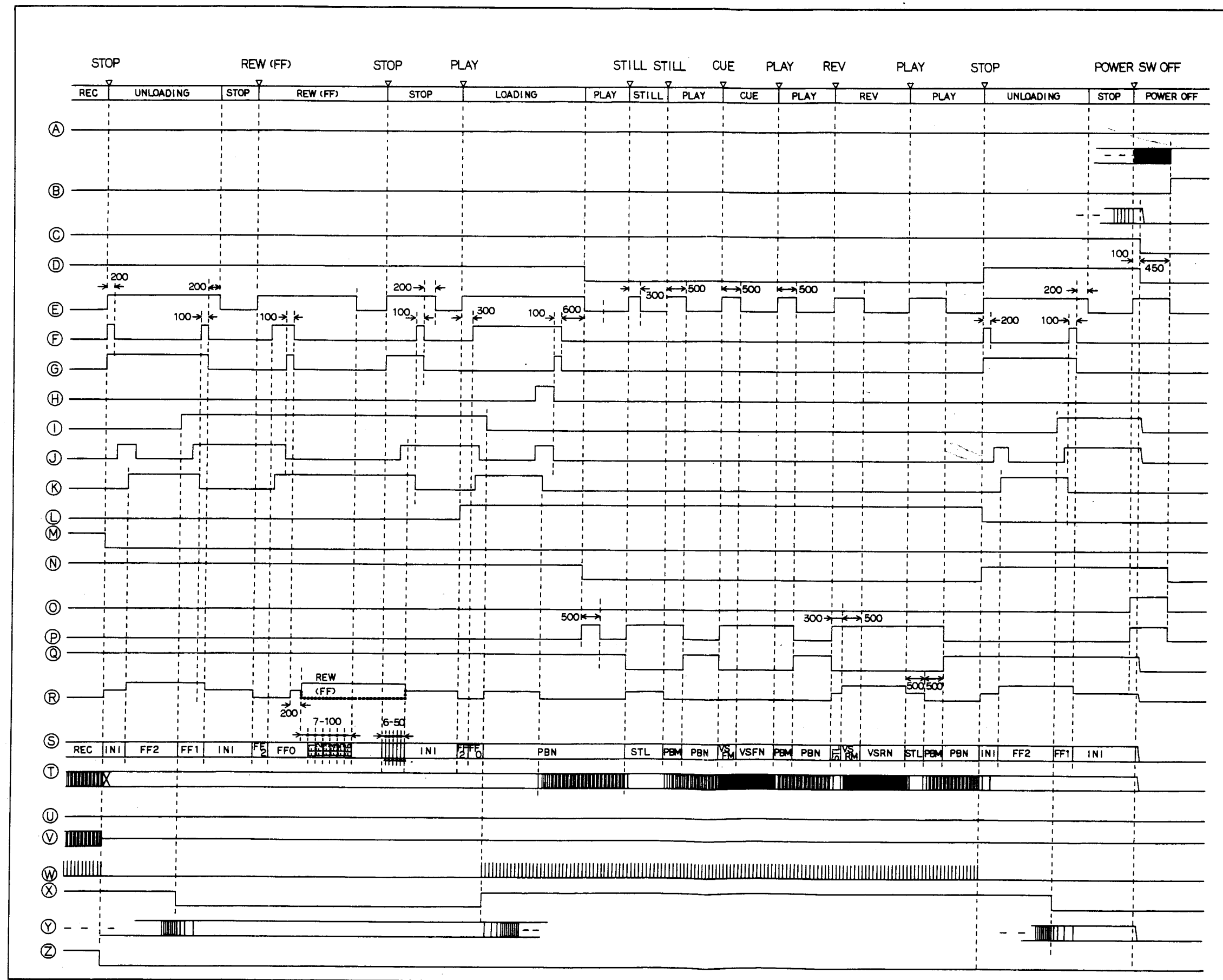


TIMING VALUES IN (ms)

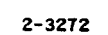
TIMING CHART

1-7228

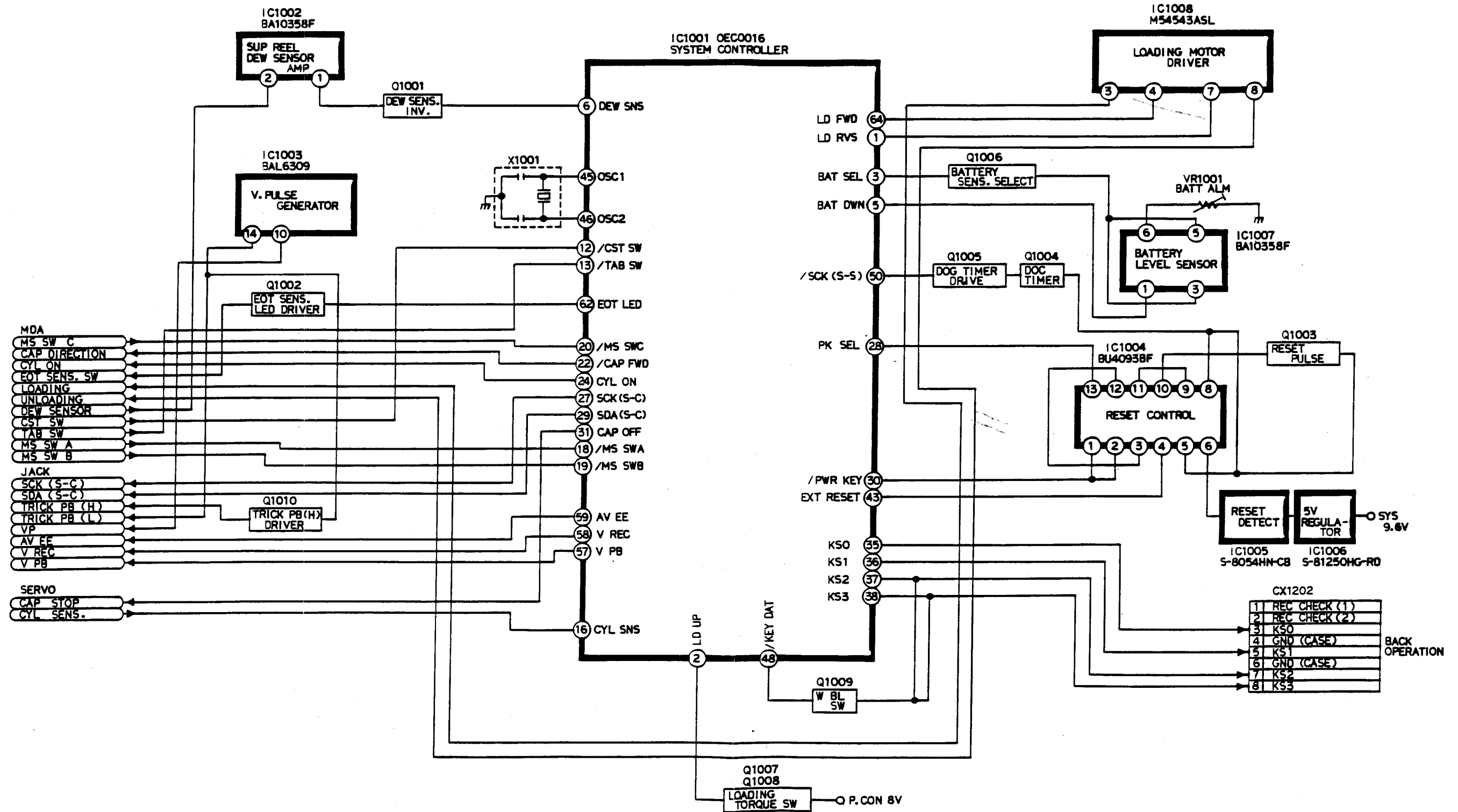
TIMING CHART



Y.C. BLOCK DIAGRAM



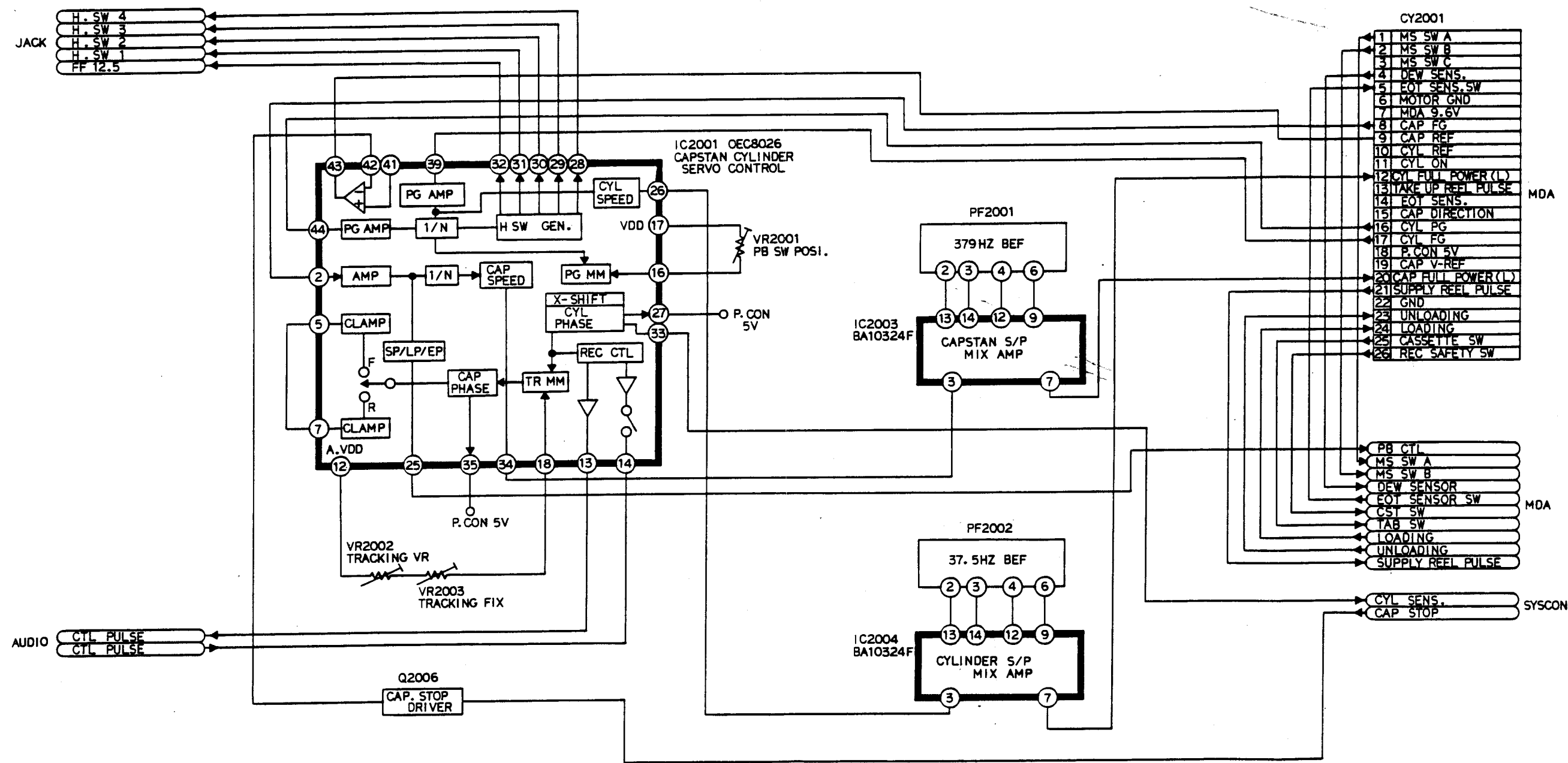
SYSTEM CONTROL BLOCK DIAGRAM



SYSTEM CONTROL BLOCK DIAGRAM

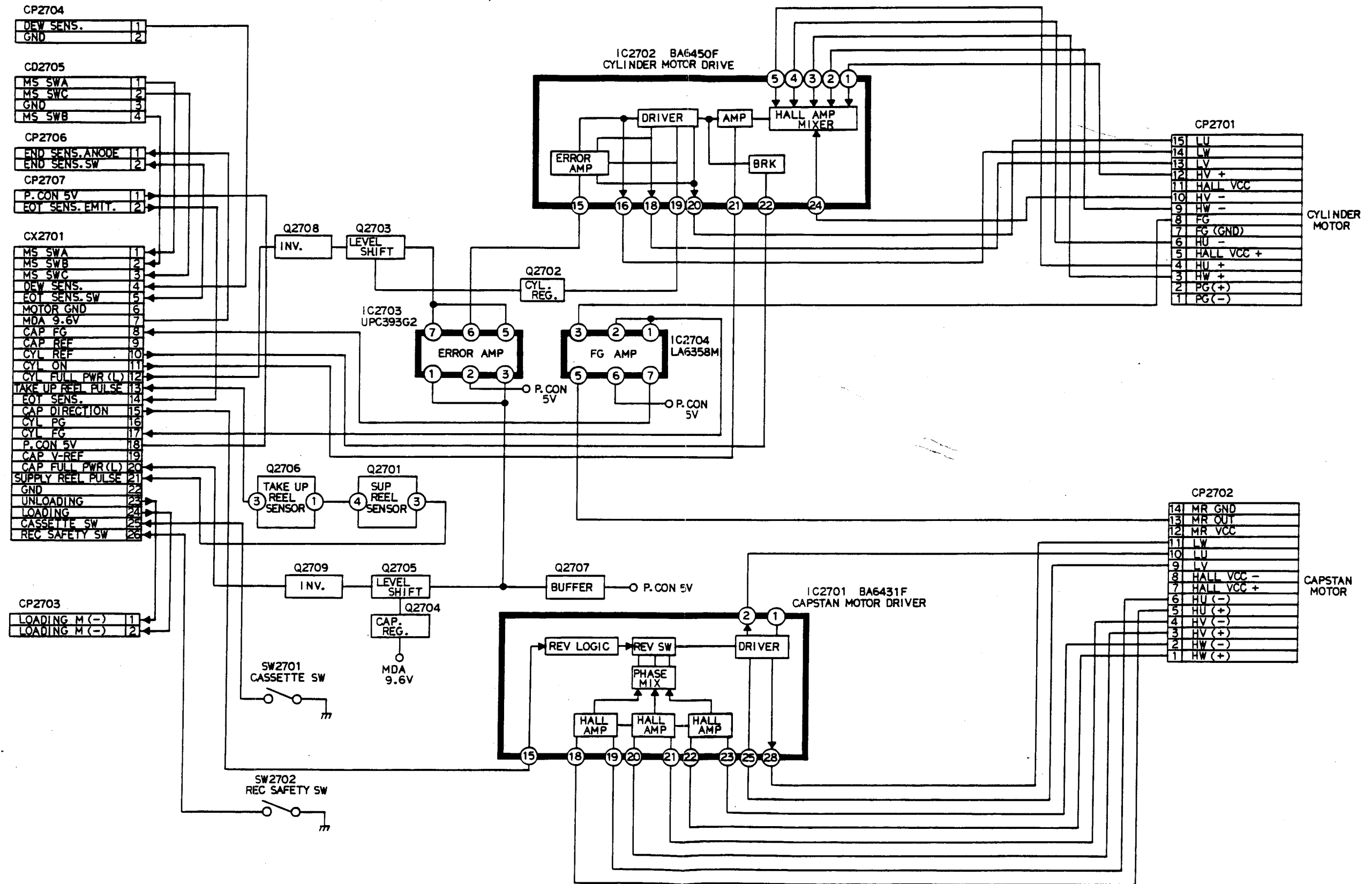
2-3273

SERVO BLOCK DIAGRAM



SERVO BLOCK DIAGRAM

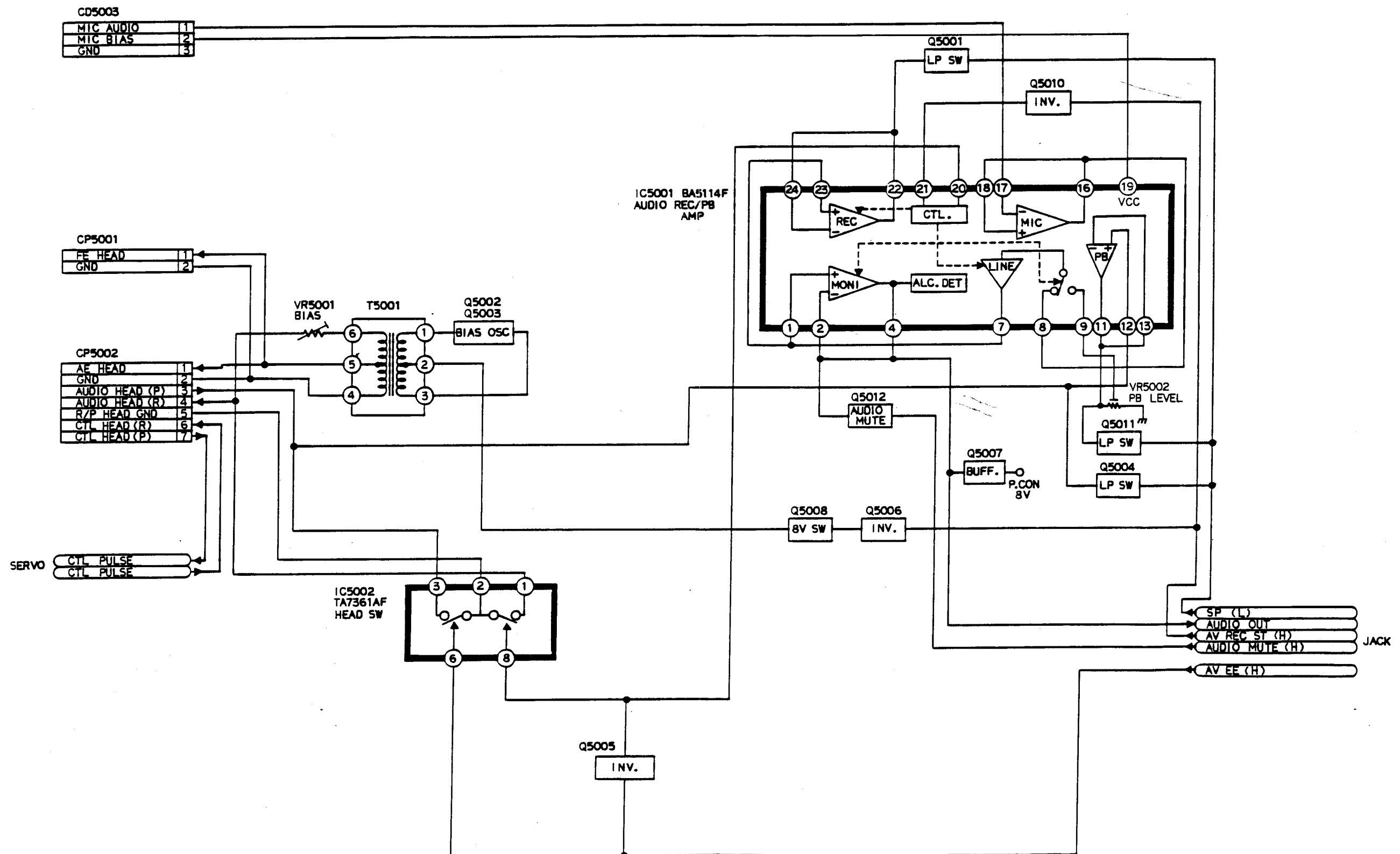
MDA BLOCK DIAGRAM



MDA BLOCK DIAGRAM

2-3129

AUDIO BLOCK DIAGRAM



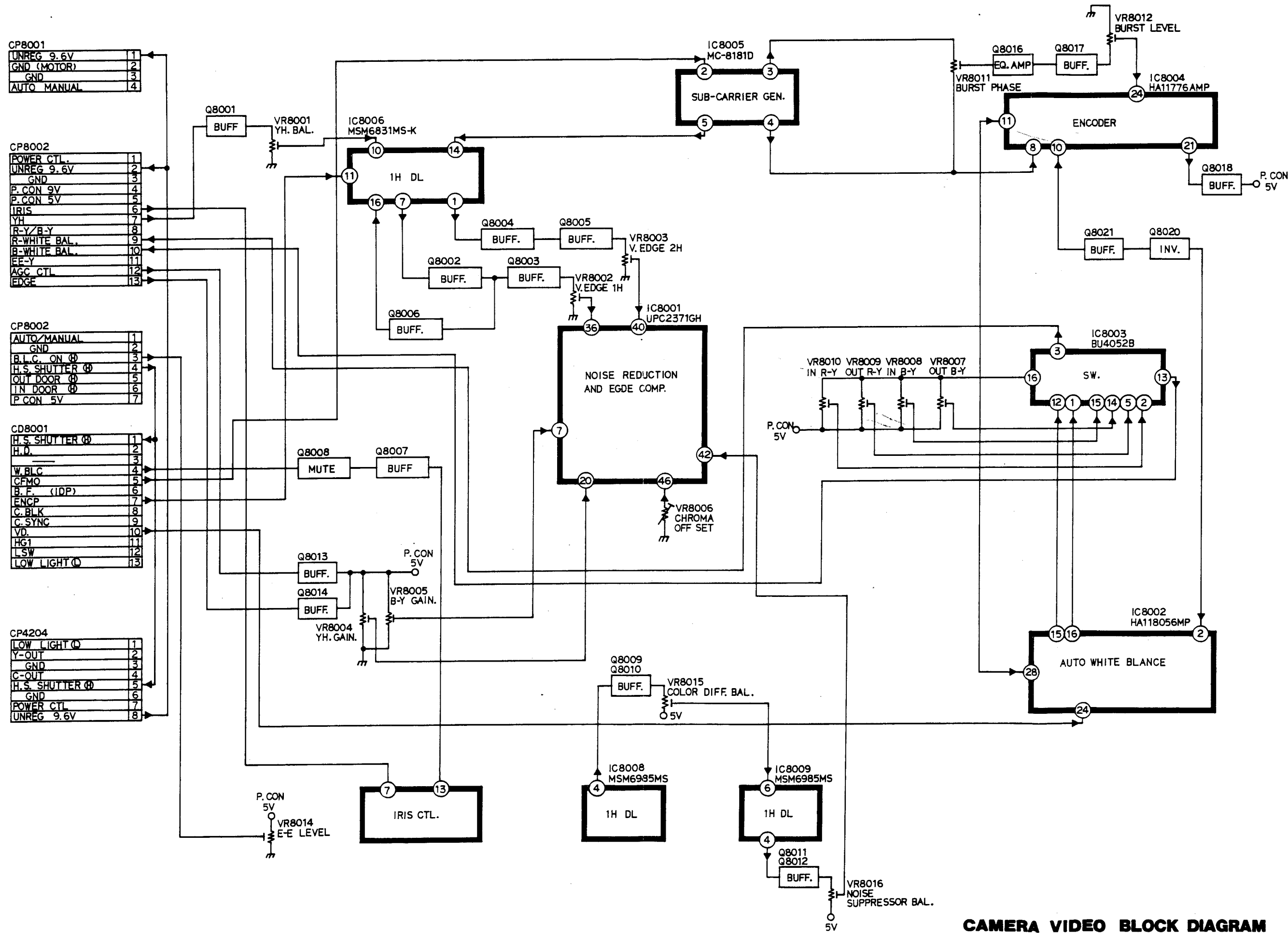
AUDIO BLOCK DIAGRAM

2-3274

SSG BLOCK DIAGRAM

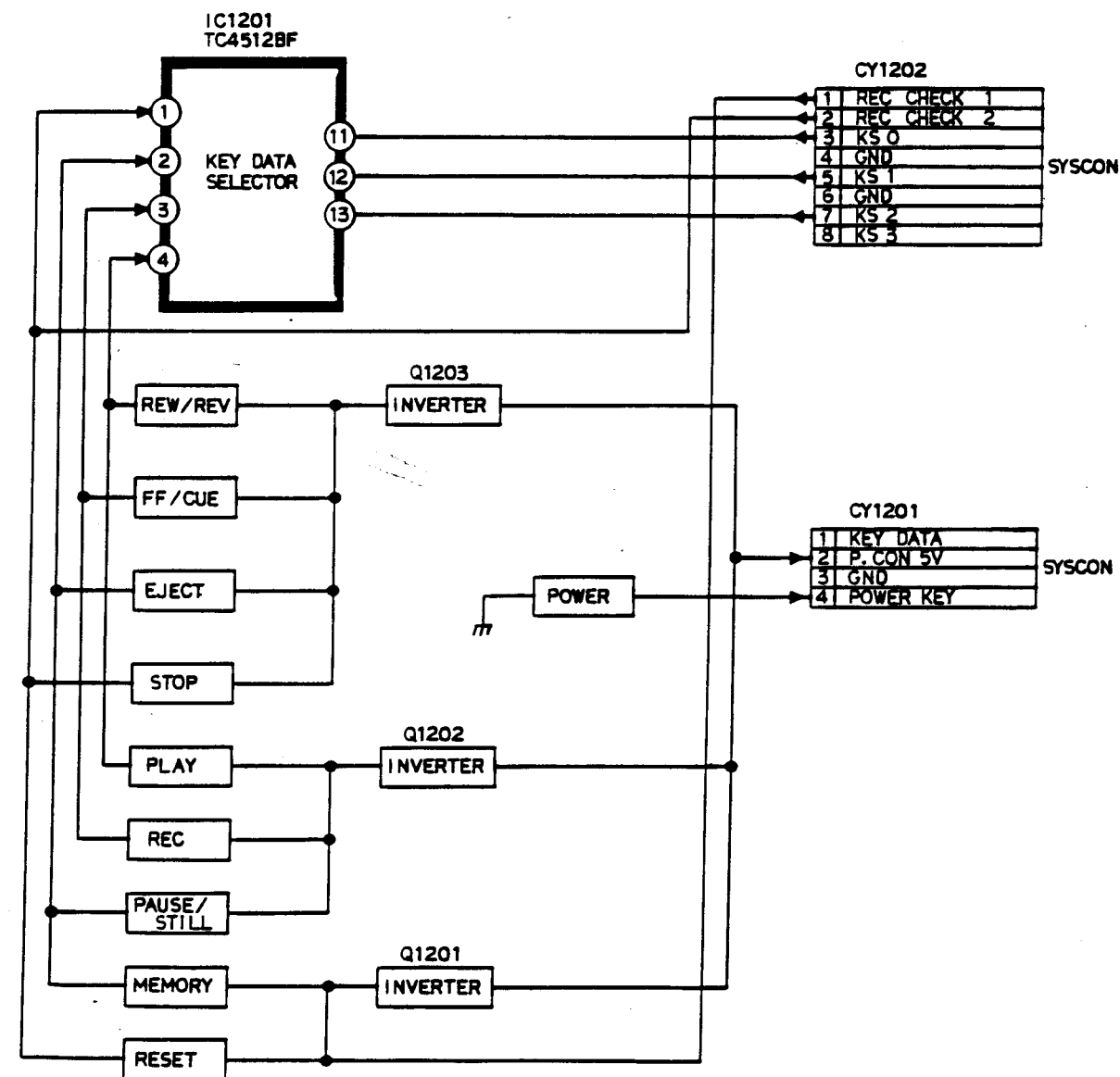
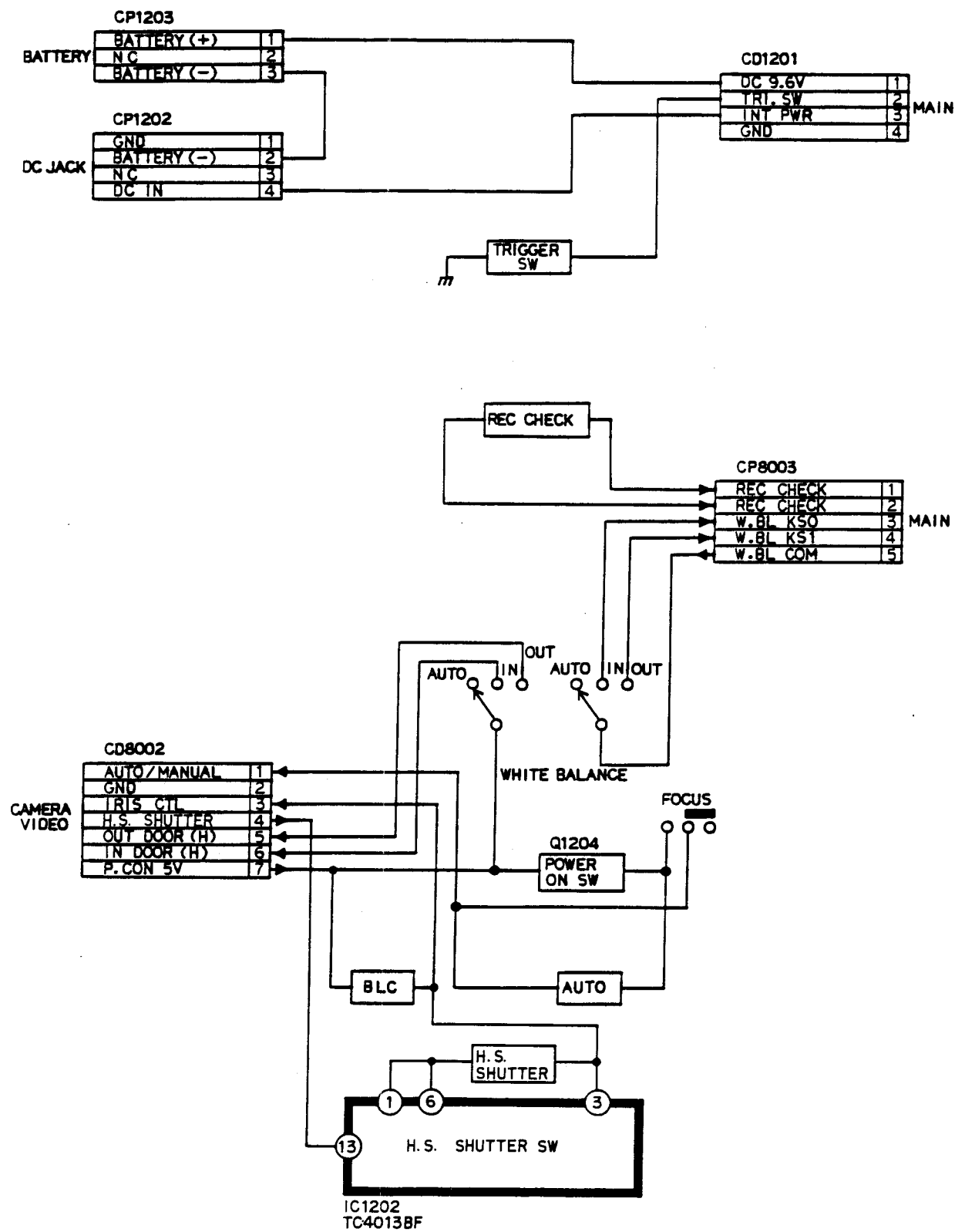


CAMERA VIDEO BLOCK DIAGRAM



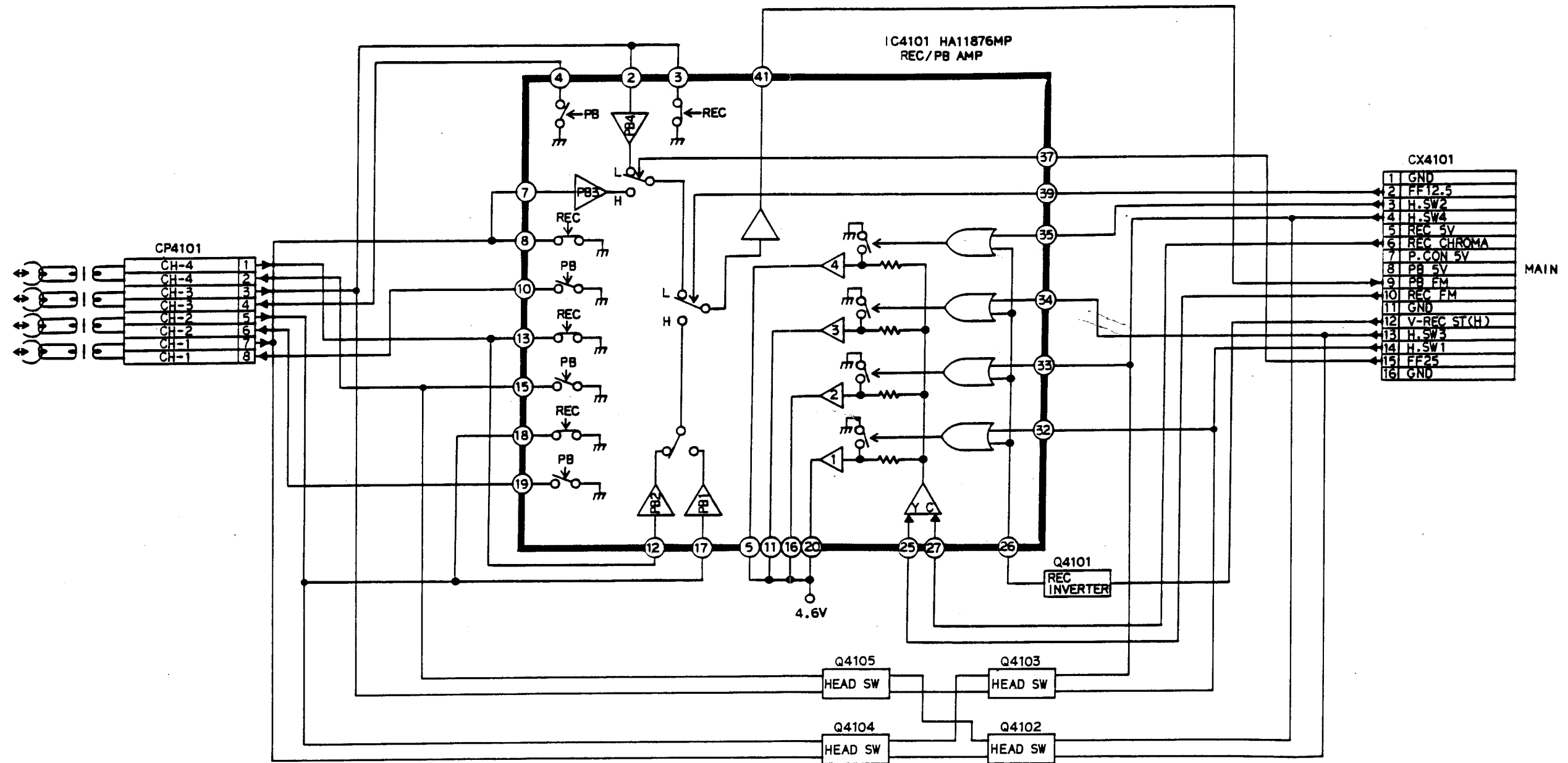
CAMERA VIDEO BLOCK DIAGRAM

OPERATION BLOCK DIAGRAM



OPERATION BLOCK DIAGRAM

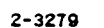
HEAD AMP BLOCK DIAGRAM



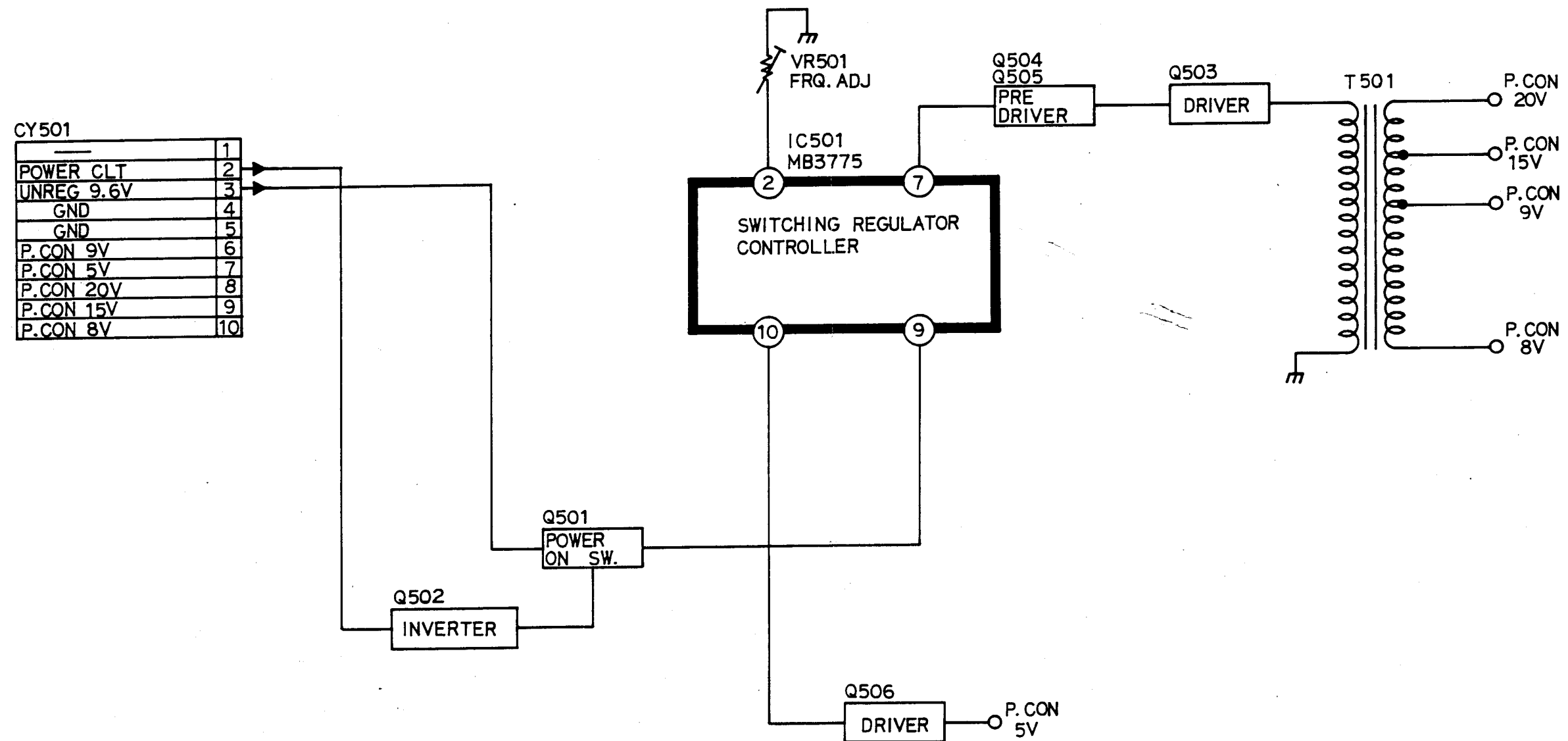
HEAD AMP BLOCK DIAGRAM

2-3277

JACK BLOCK DIAGRAM



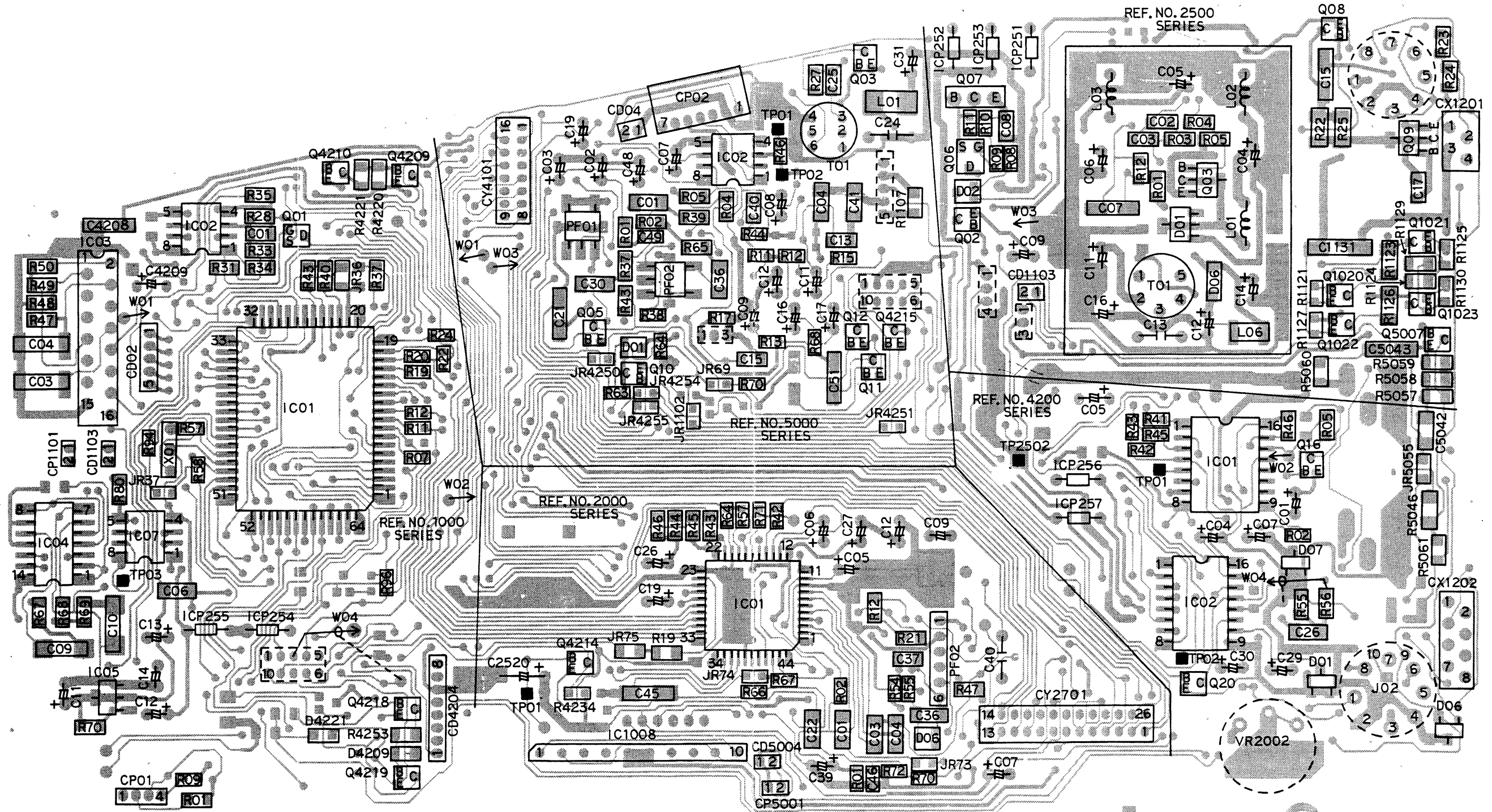
DC-DC CONVERTER BLOCK DIAGRAM



DC-DC CONVERTER BLOCK DIAGRAM

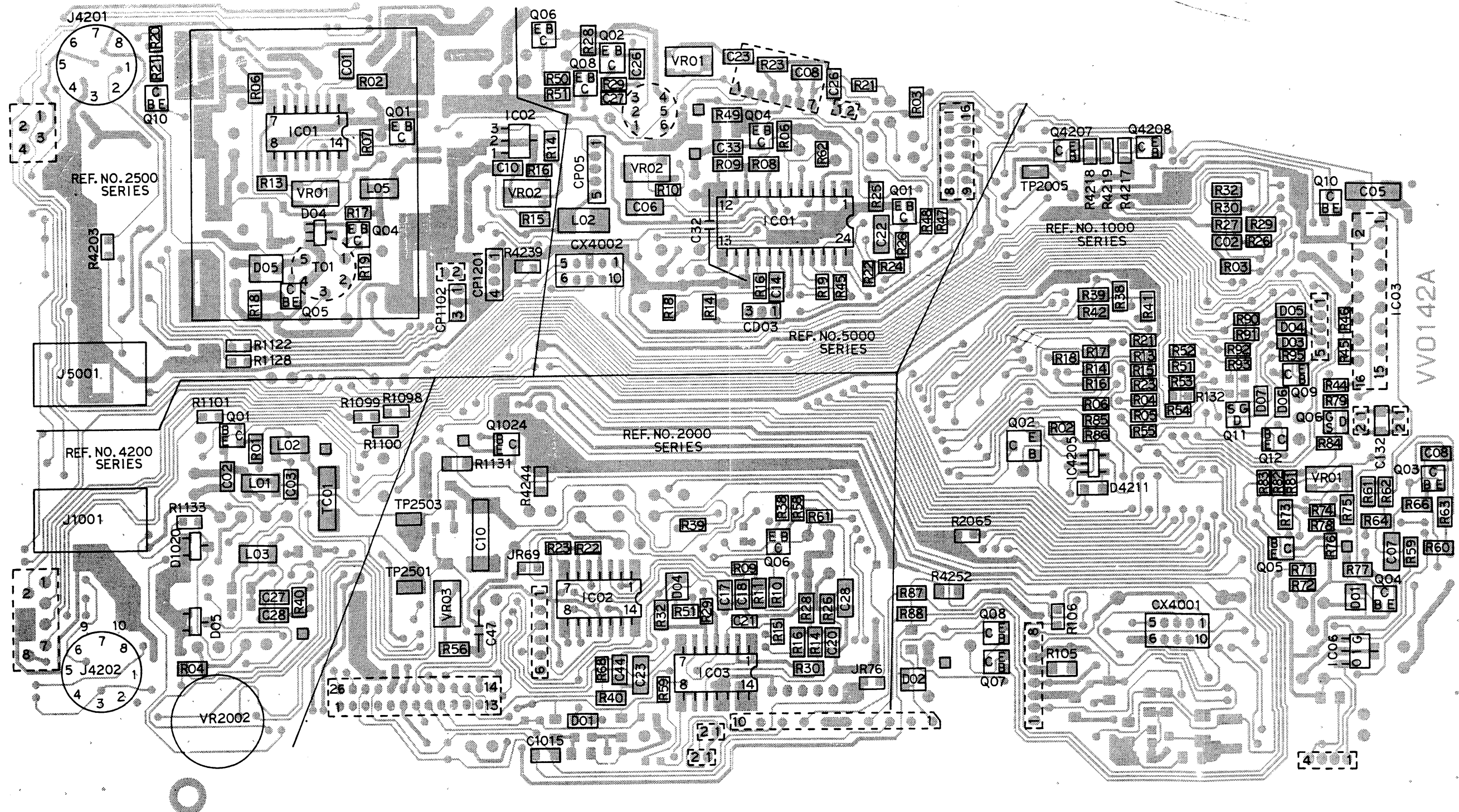
MAIN P.C.BOARD

TOP



MAIN P.C.BOARD

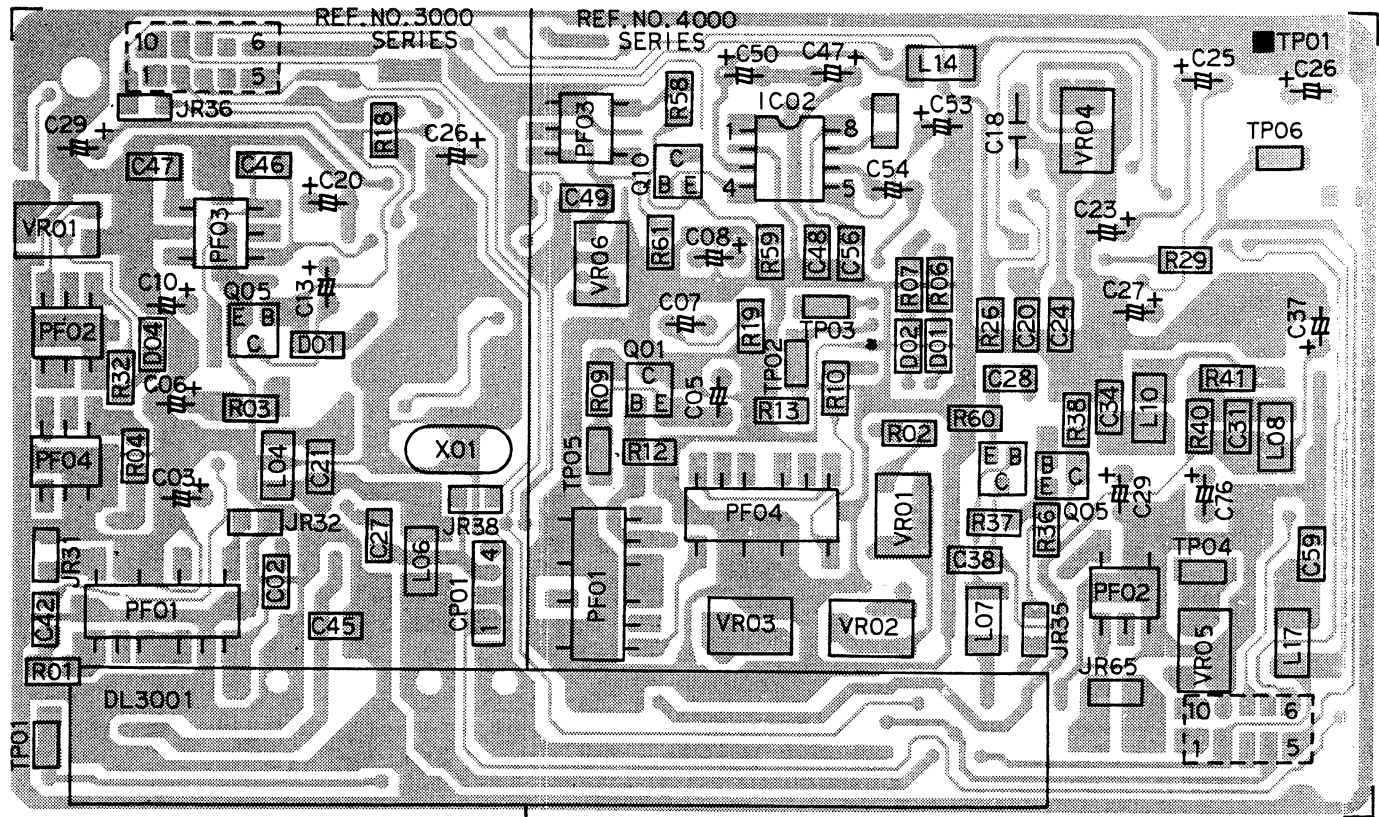
BOTTOM



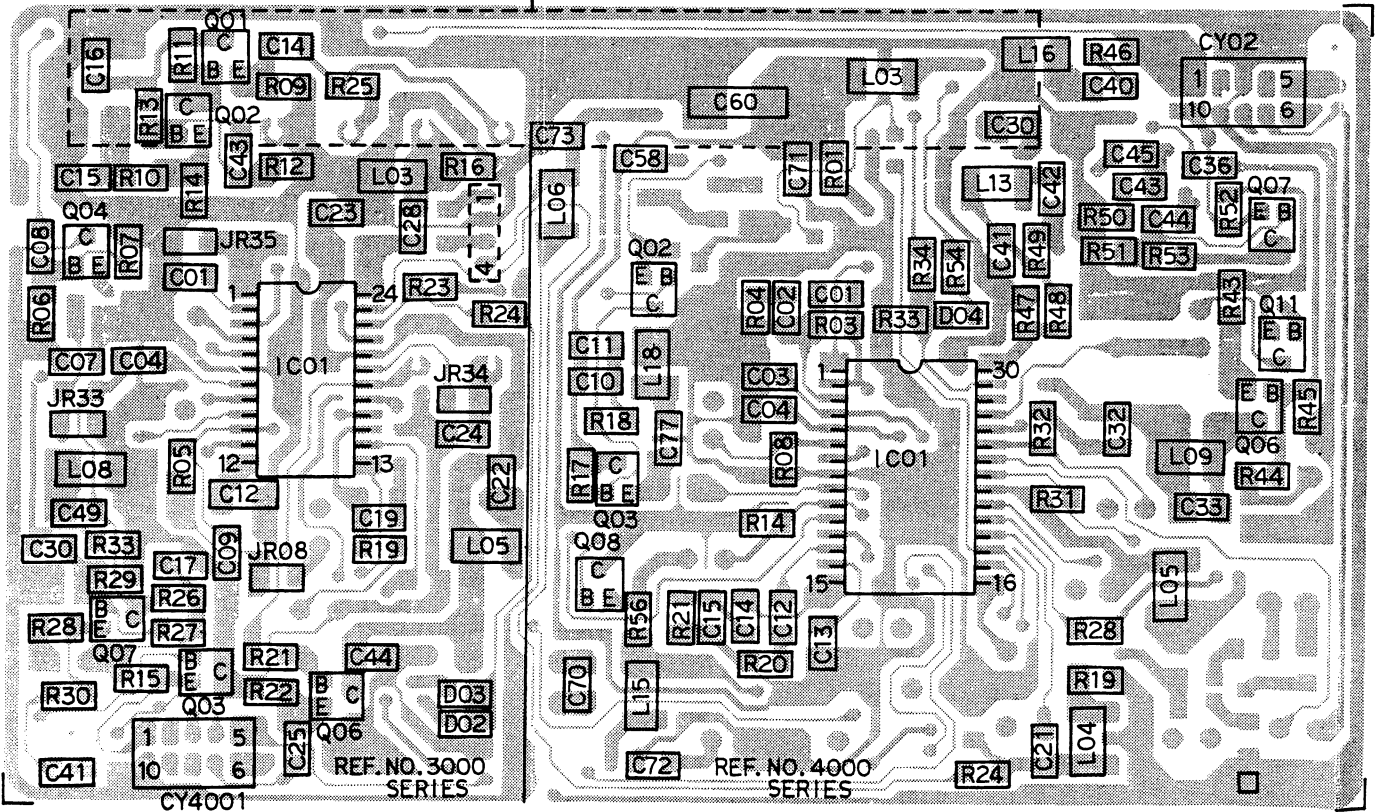
33

Y.C. P.C.BOARD

TOP

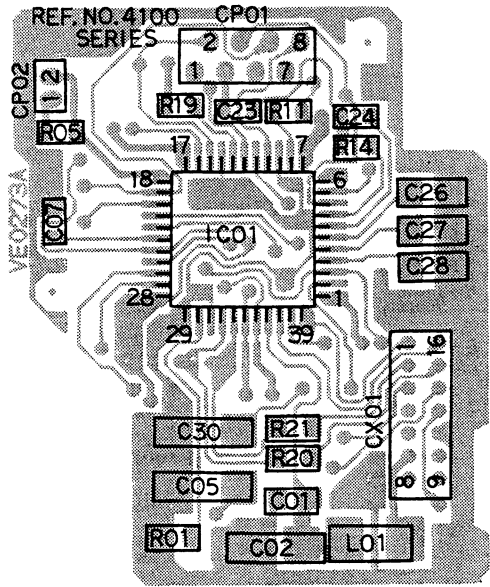


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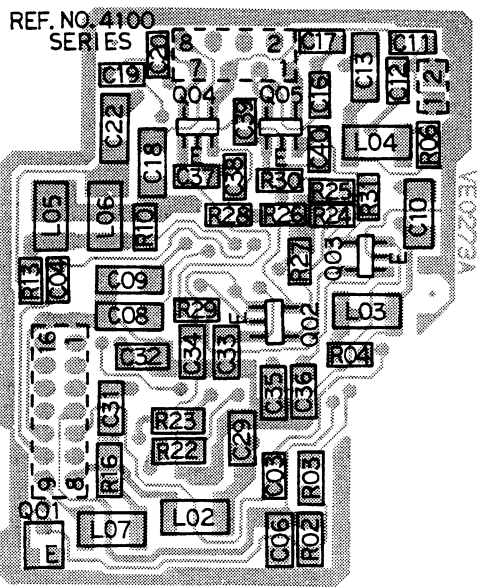


HEAD AMP P.C.BOARD

TOP

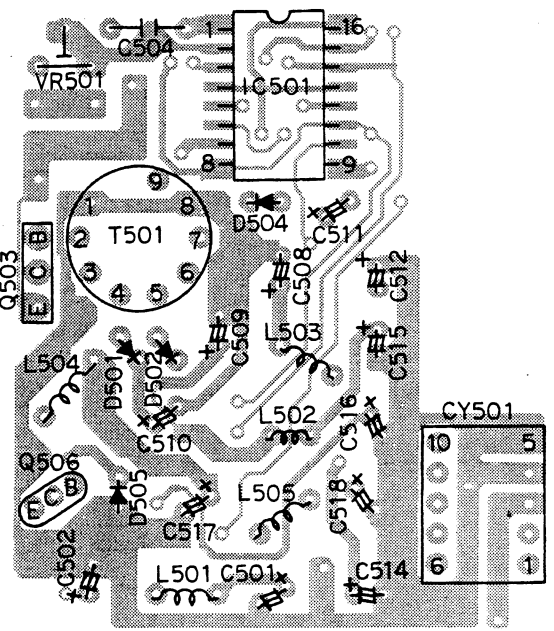


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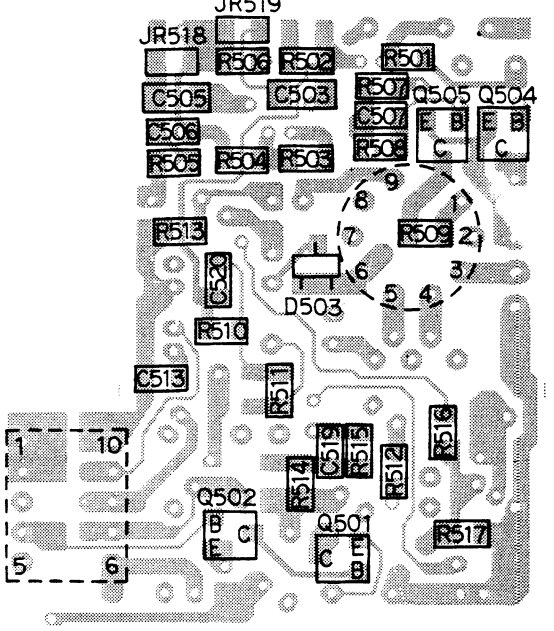


DC-DC CONVERTER P.C.BOARD

TOP

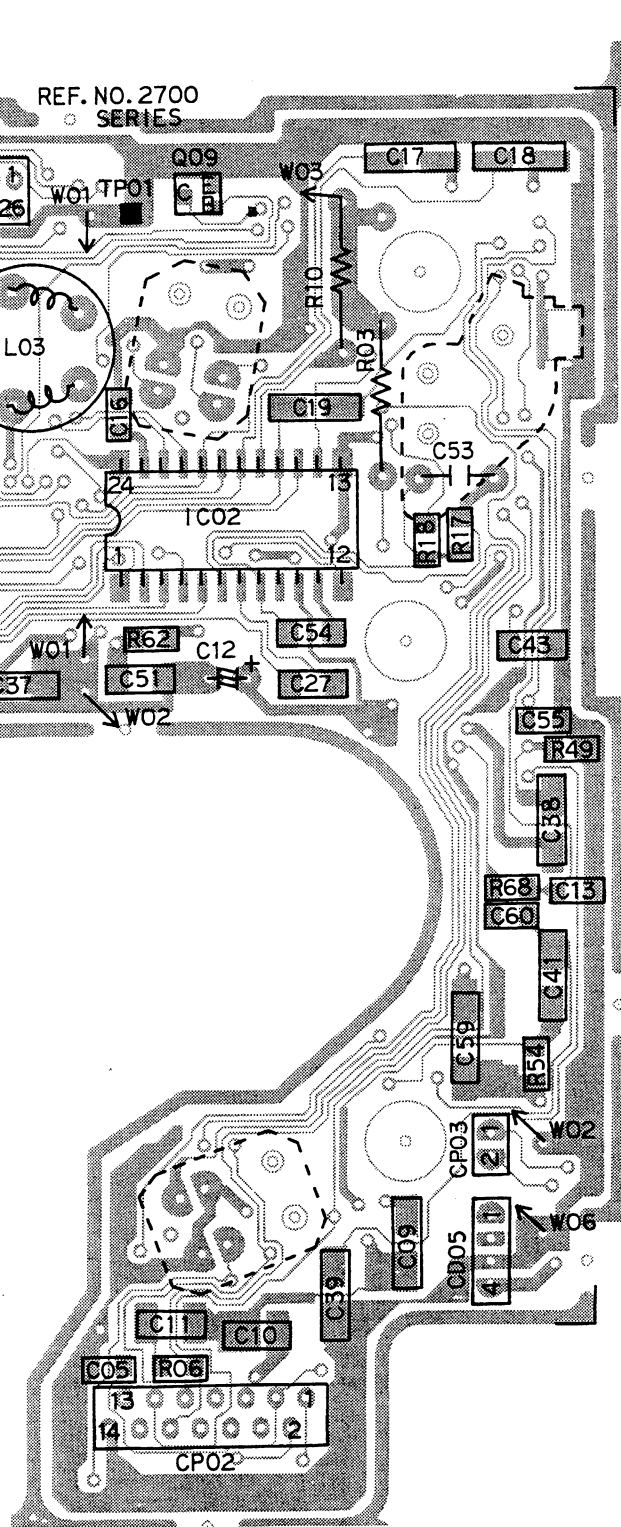


BOTTOM

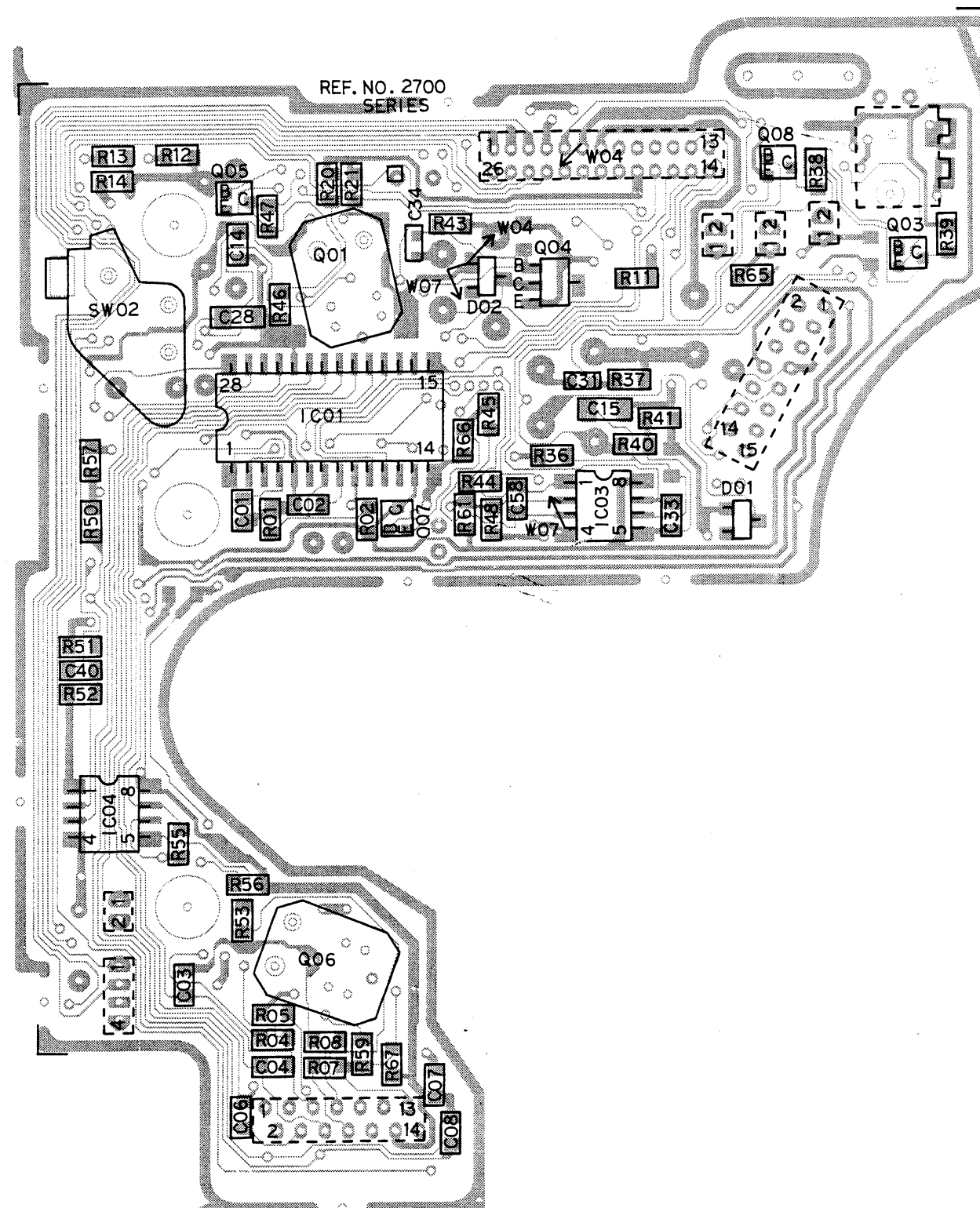


MDA P.C.BOARD

TOP

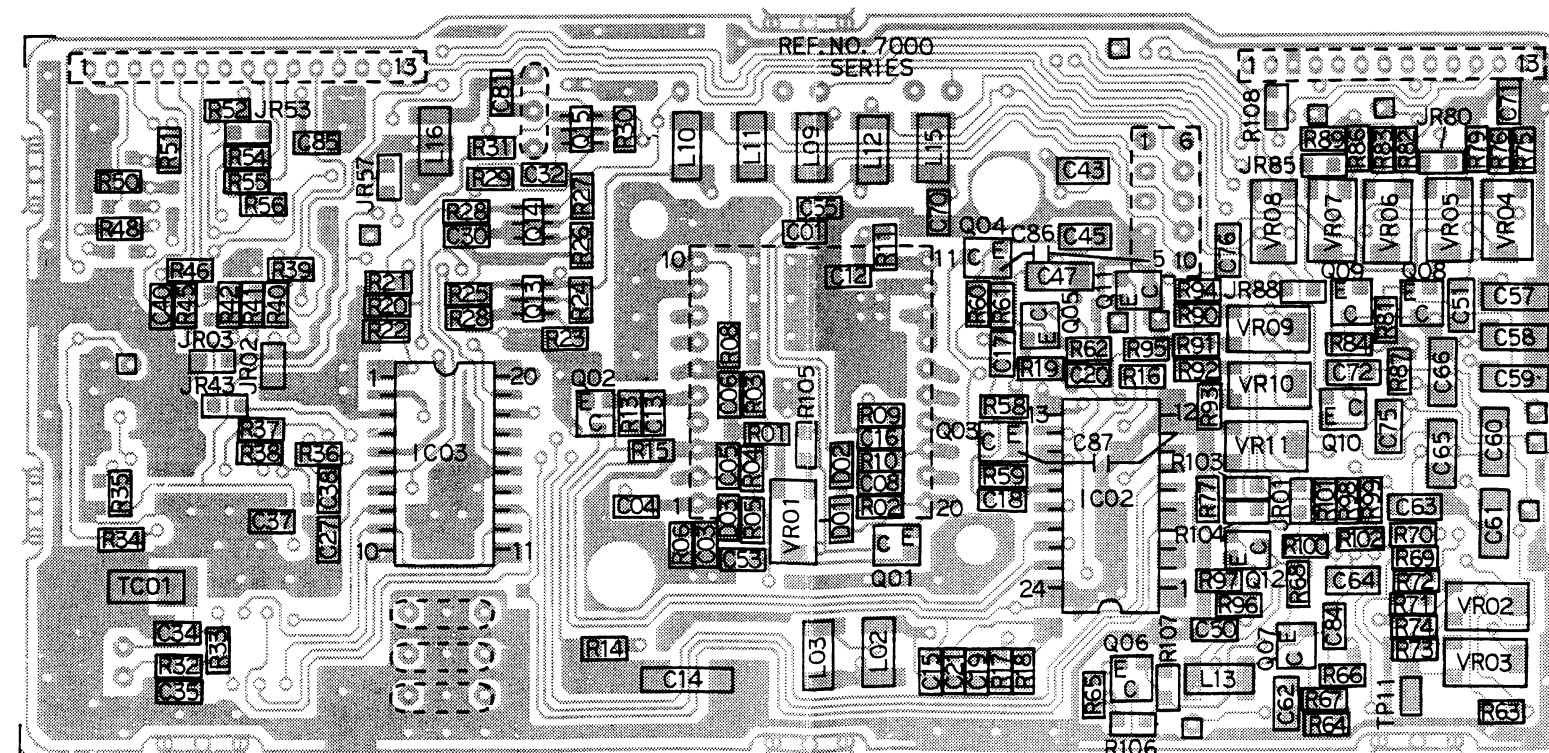


BOTTOM



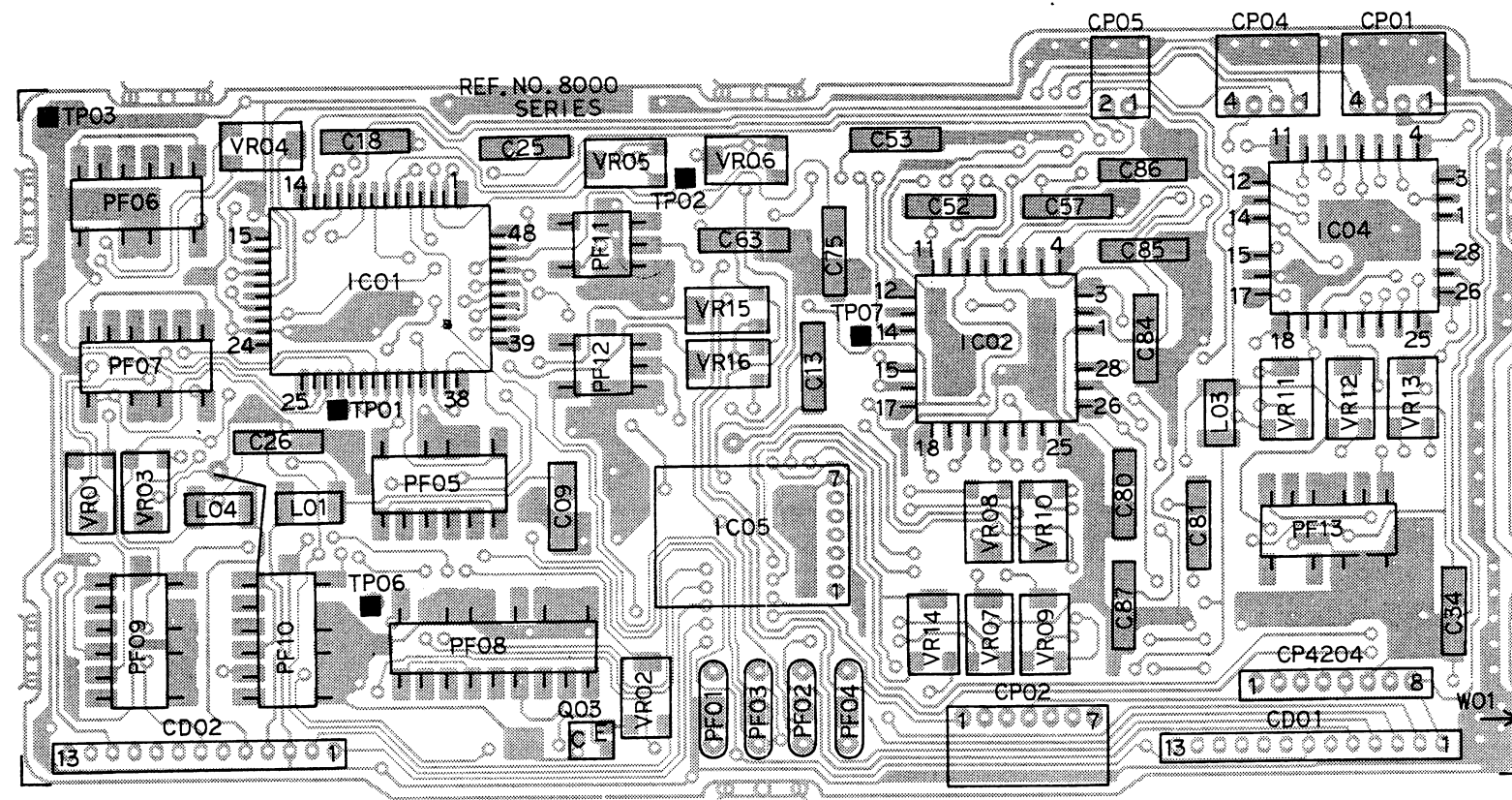
MDA P.C.BOARD

TOP

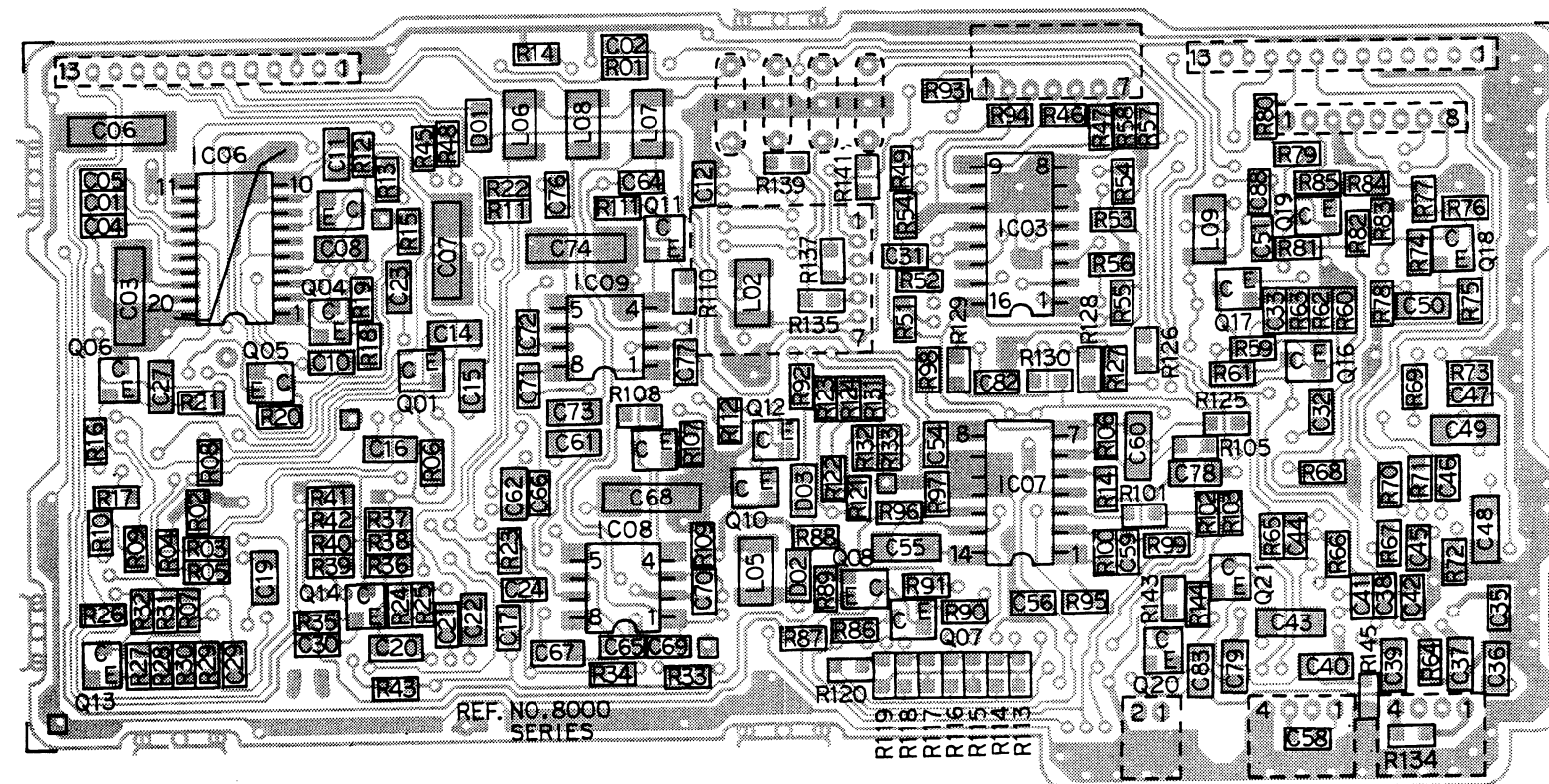


36

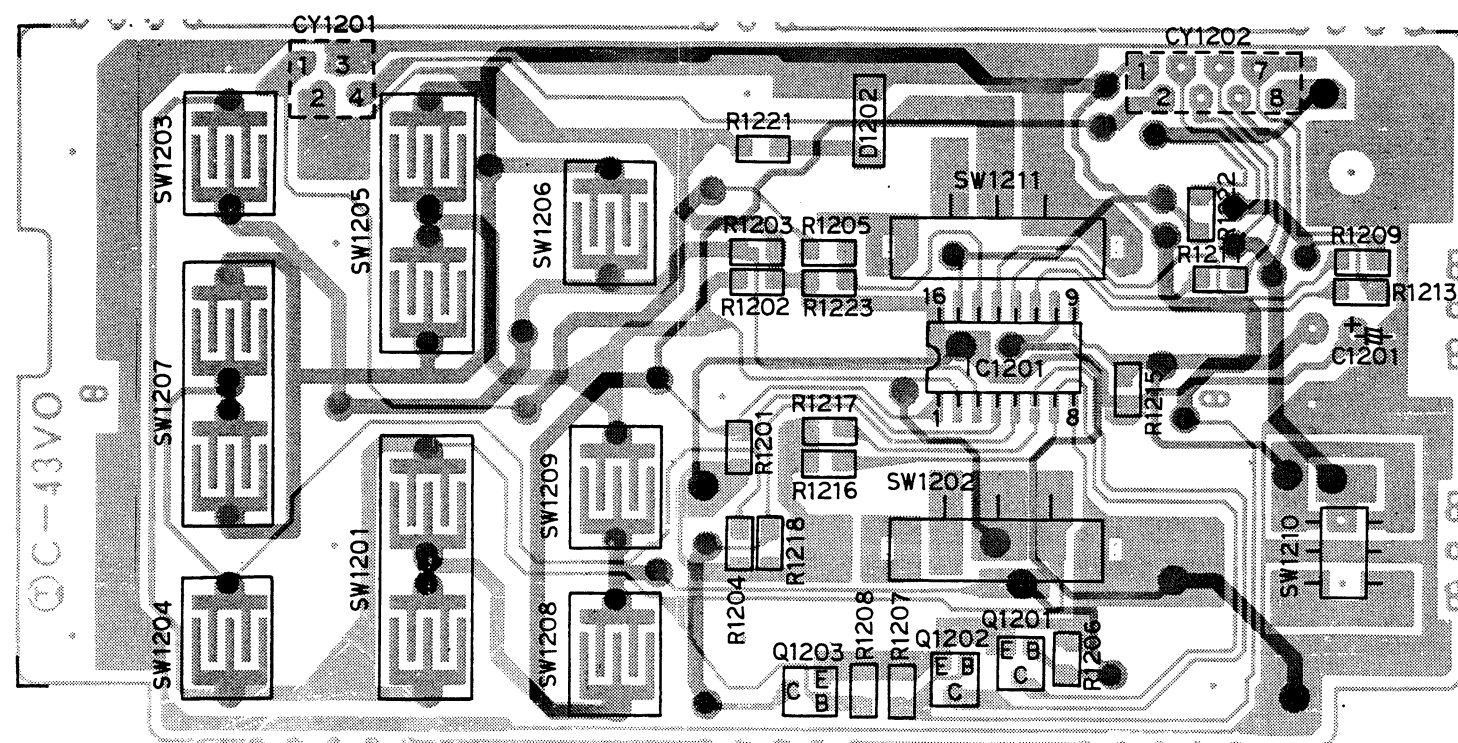
TOP



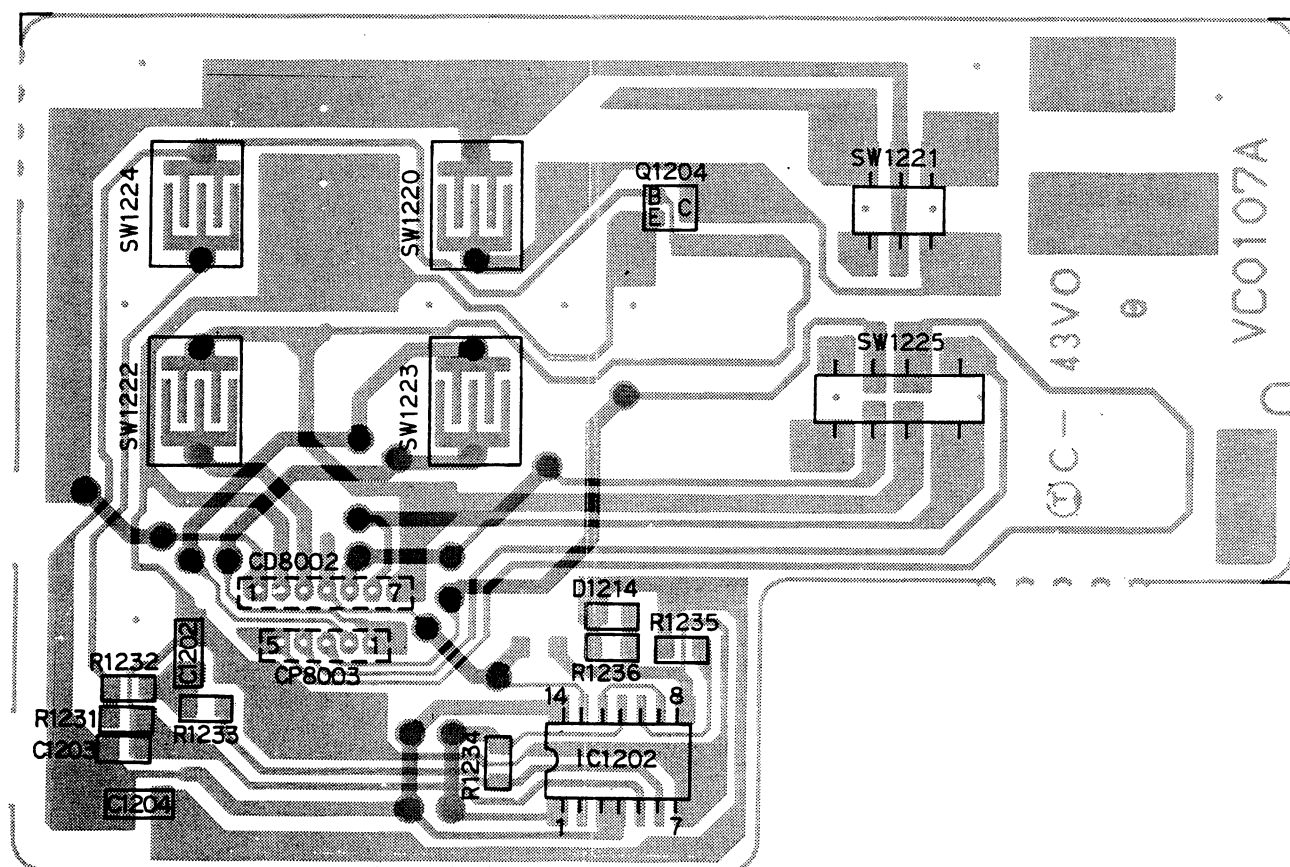
BOTTOM



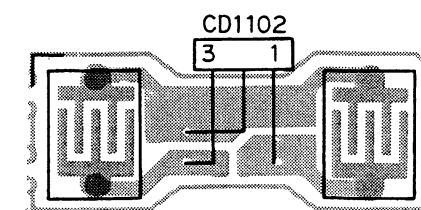
BACK OPERATION P.C.BOARD



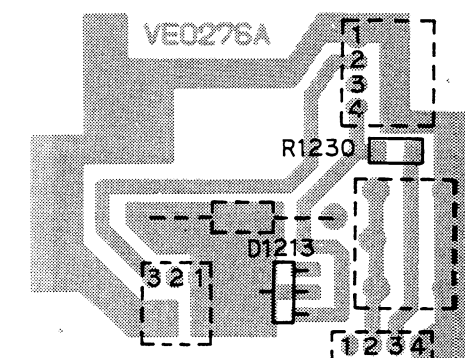
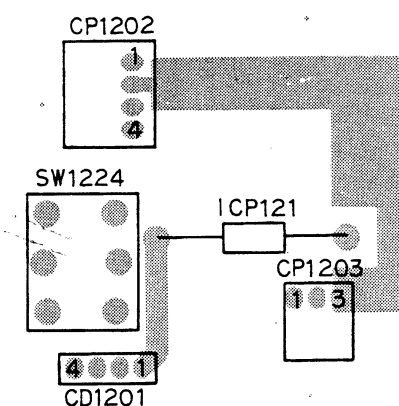
SIDE OPERATION P.C.BOARD



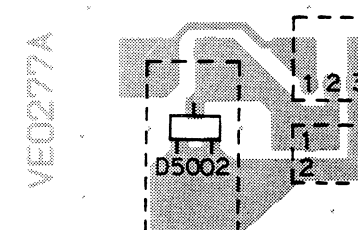
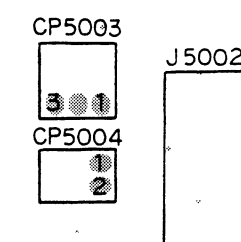
ZOOM P.C.BOARD



DC JACK P.C. BOARD

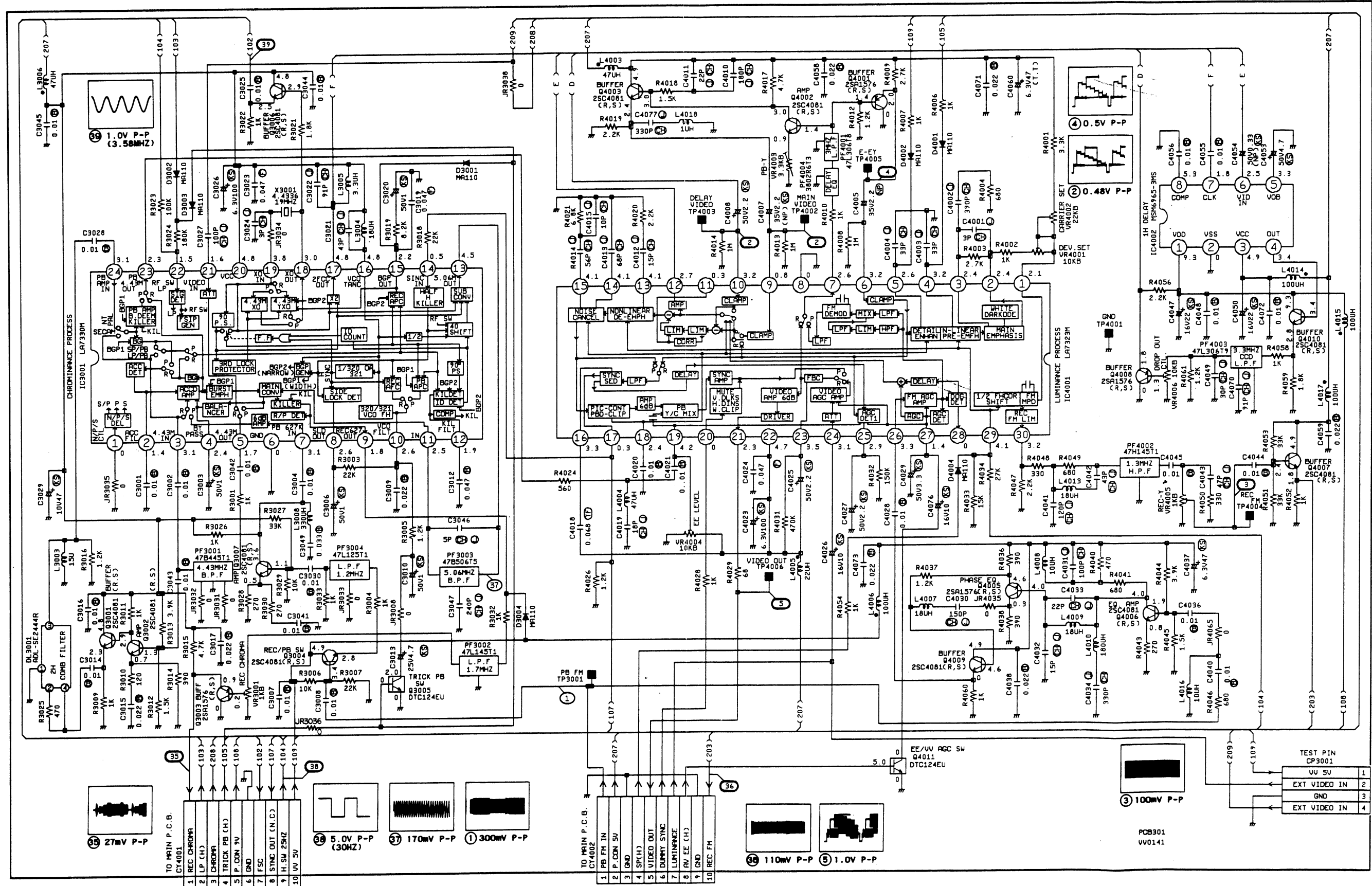
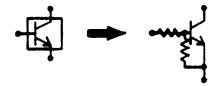


MIC P.C.BOARD



Y.C. SCHEMATIC DIAGRAM

CAUTION: DIGITAL TRANSISTOR

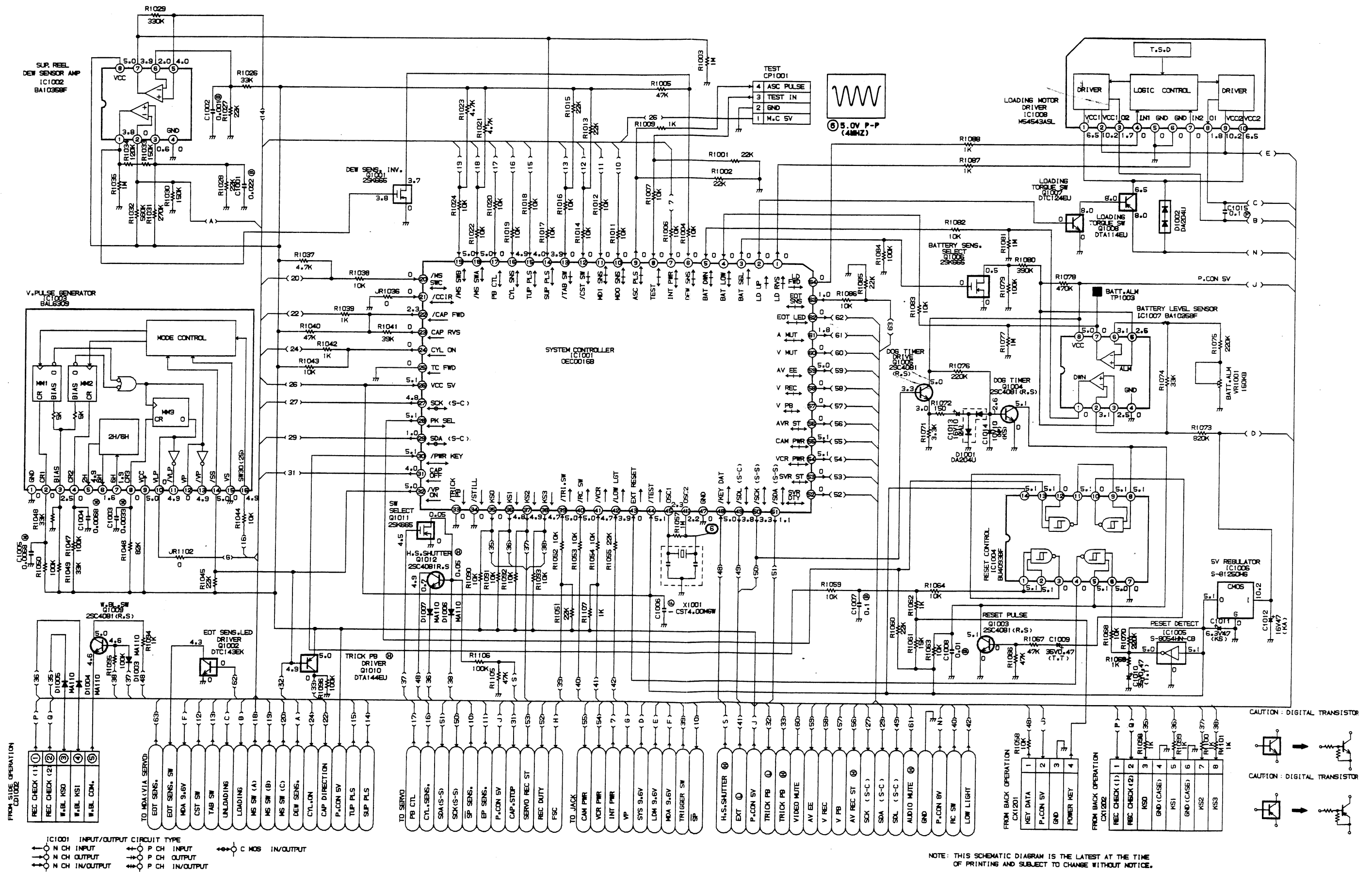


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

Y.C. SCHEMATIC DIAGRAM

1-7912

SYSTEM CONTROL SCHEMATIC DIAGRAM



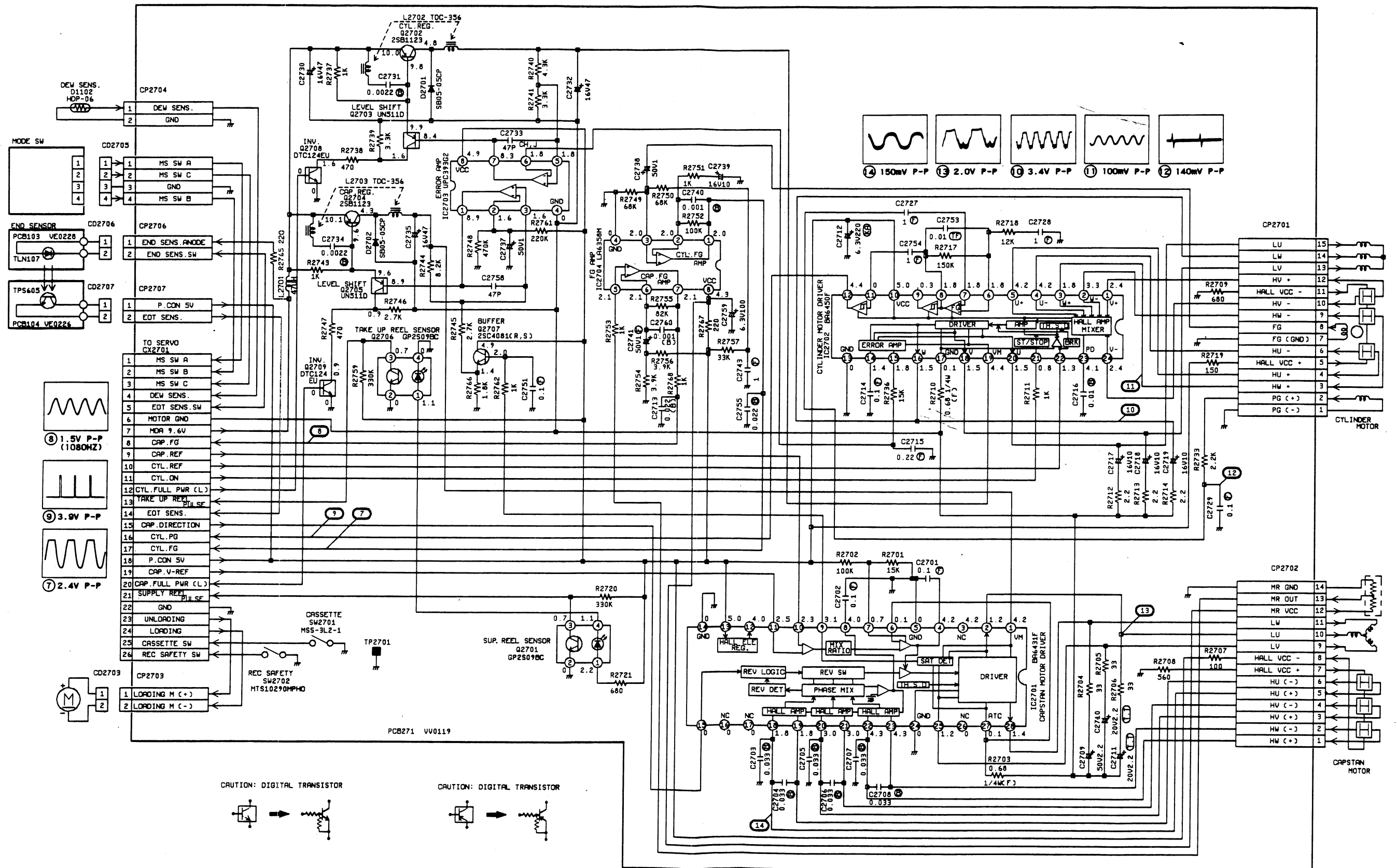
SYSTEM CONTROL SCHEMATIC DIAGRAM

19 5.0V P-P

20 5.0V P-P



MDA SCHEMATIC DIAGRAM

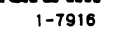


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

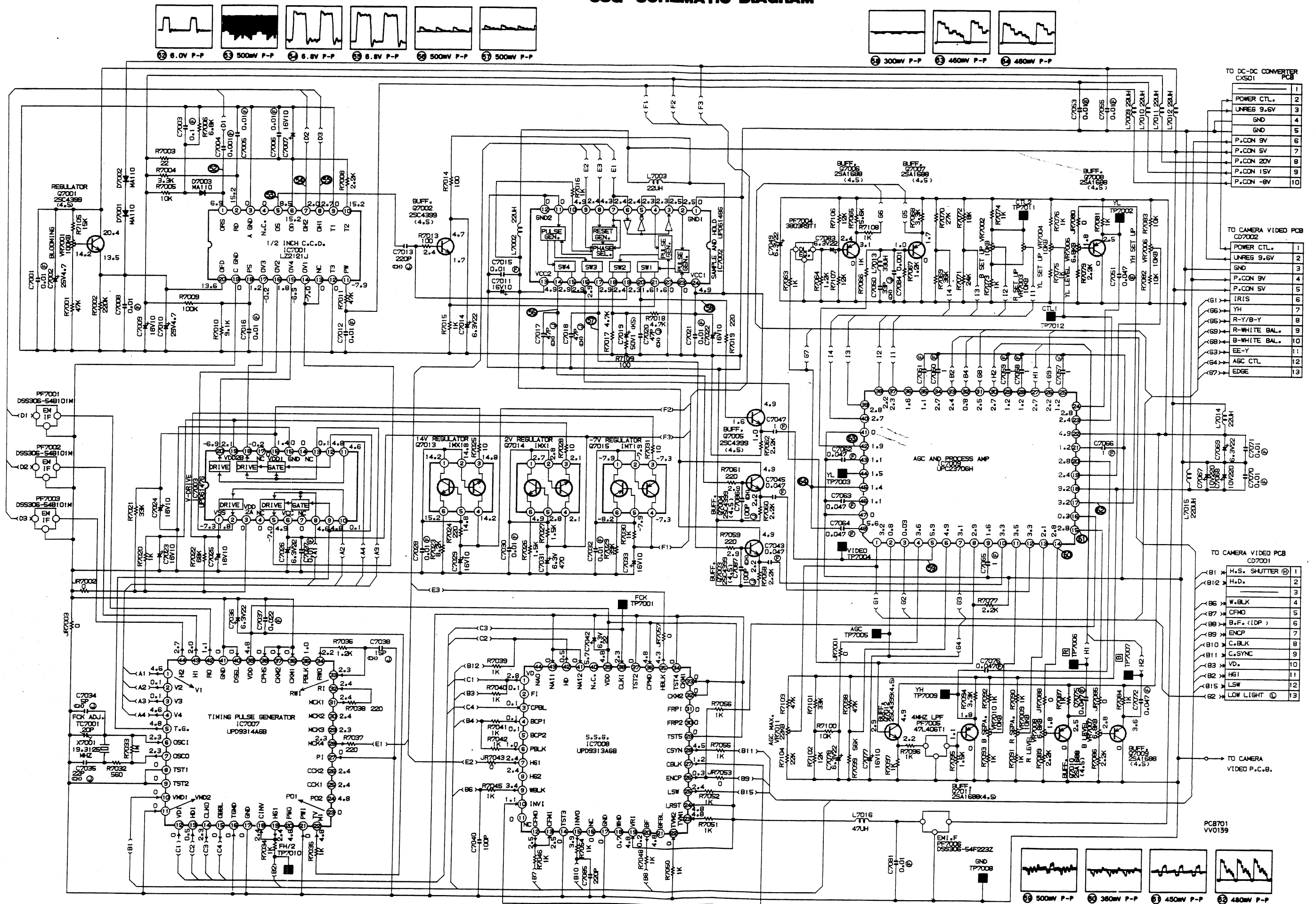
MDA SCHEMATIC DIAGRAM

1-7915

AUDIO SCHEMATIC DIAGRAM

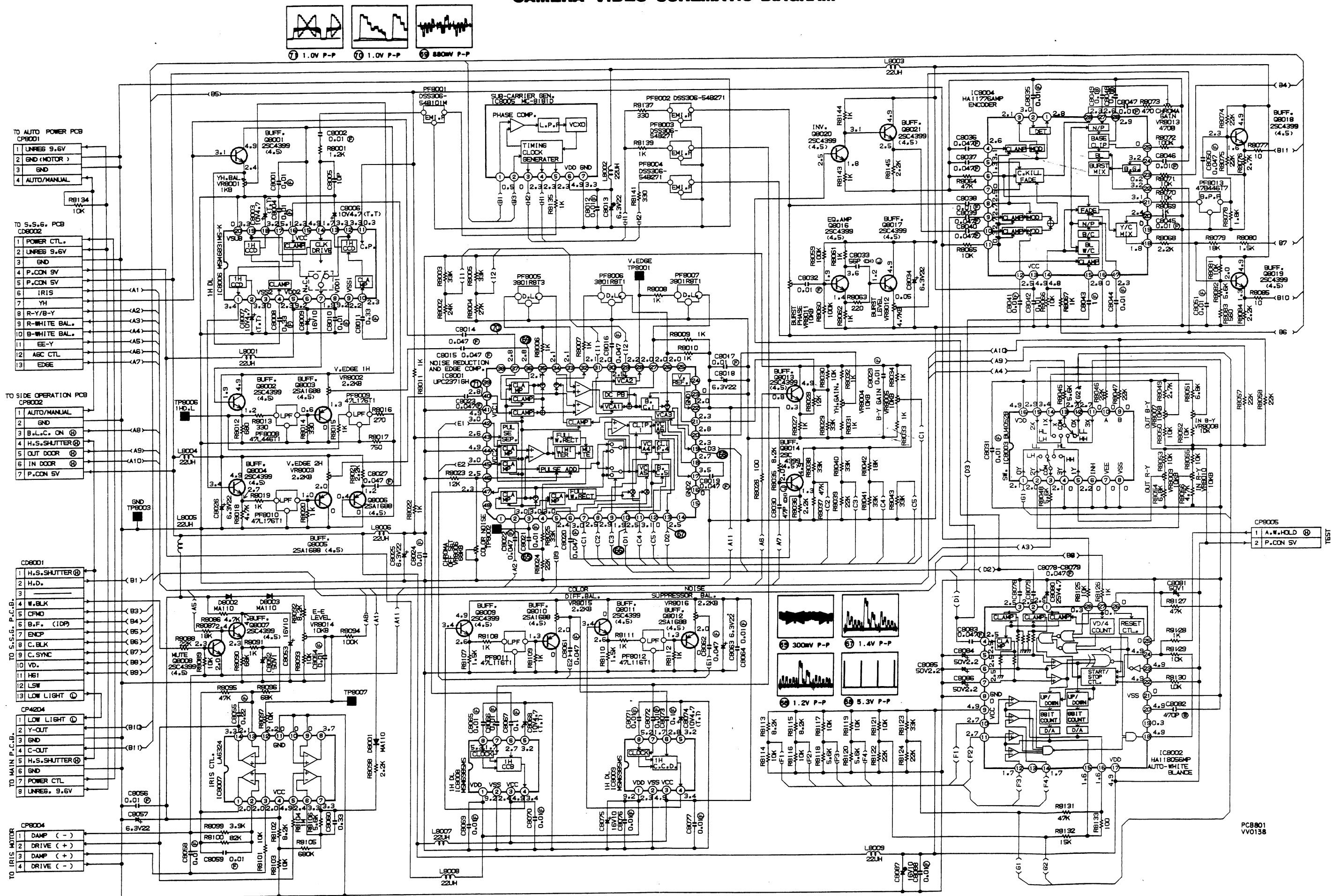


SSG SCHEMATIC DIAGRAM

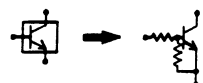
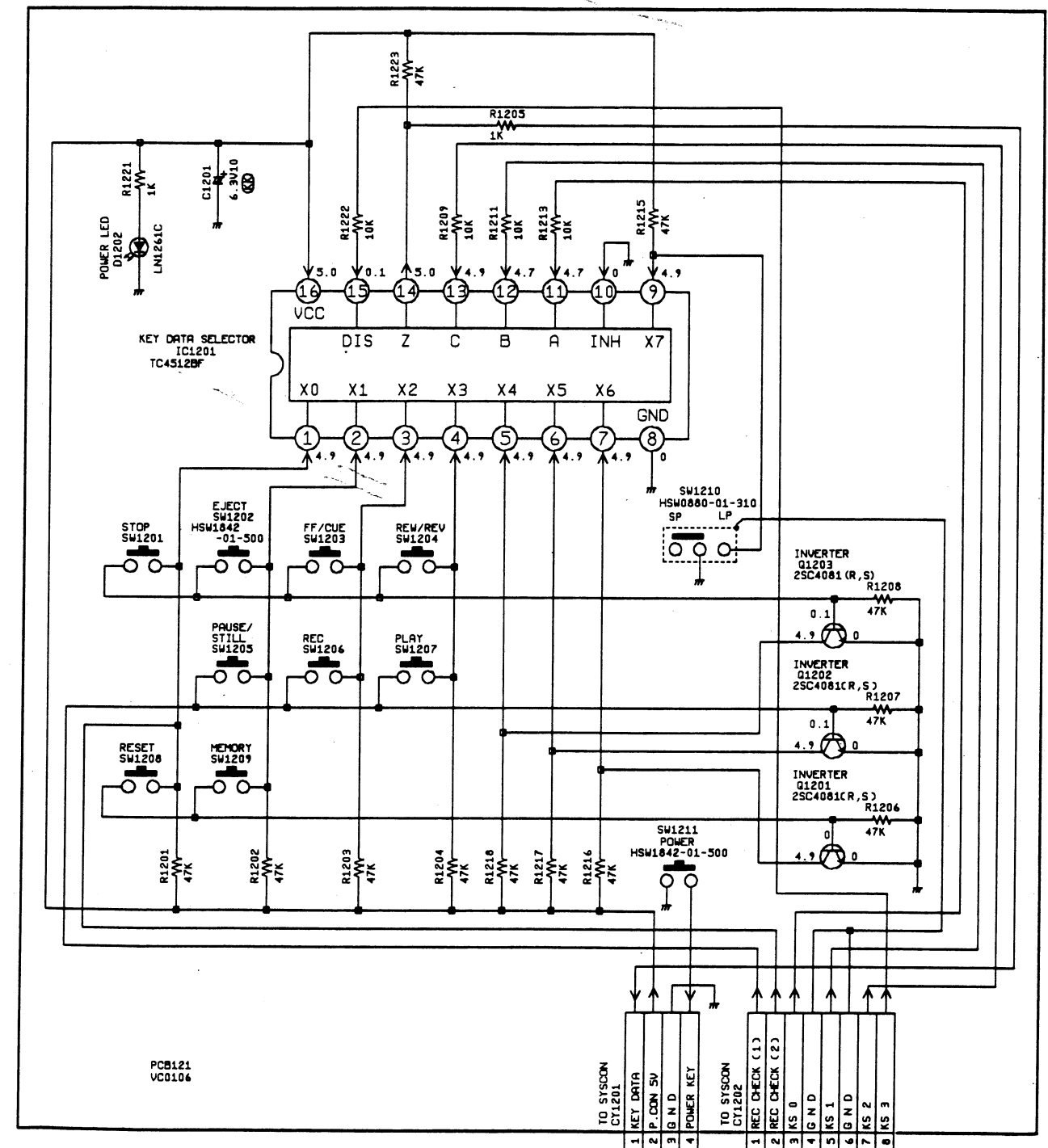


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAMERA VIDEO SCHEMATIC DIAGRAM



OPERATION SCHEMATIC DIAGRAM

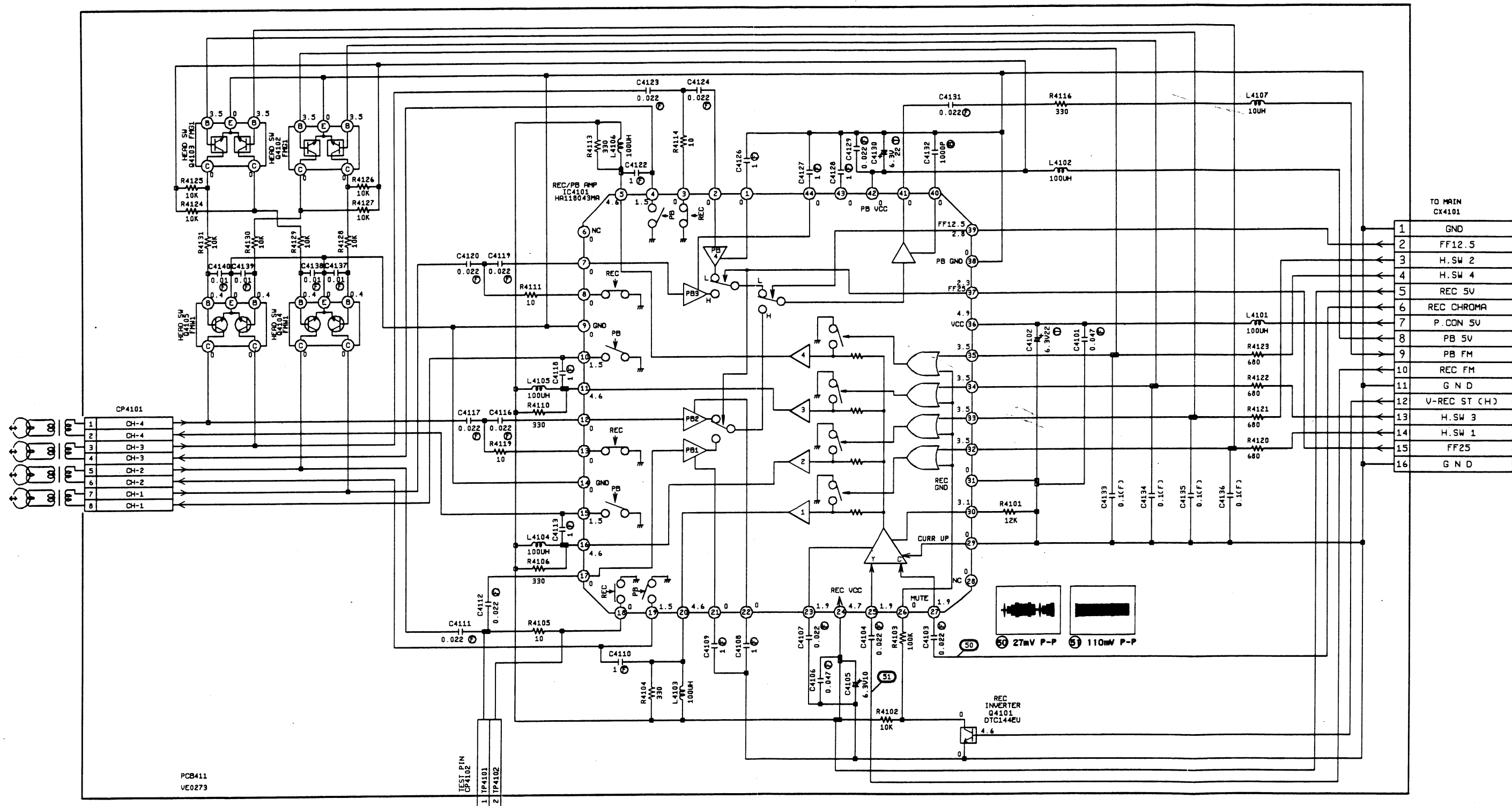


CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED ON PARTS LIST ONLY.

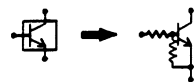
ATTENTION: LES PIÈCES REPARÉES PAR UN  ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

HEAD AMP SCHEMATIC DIAGRAM



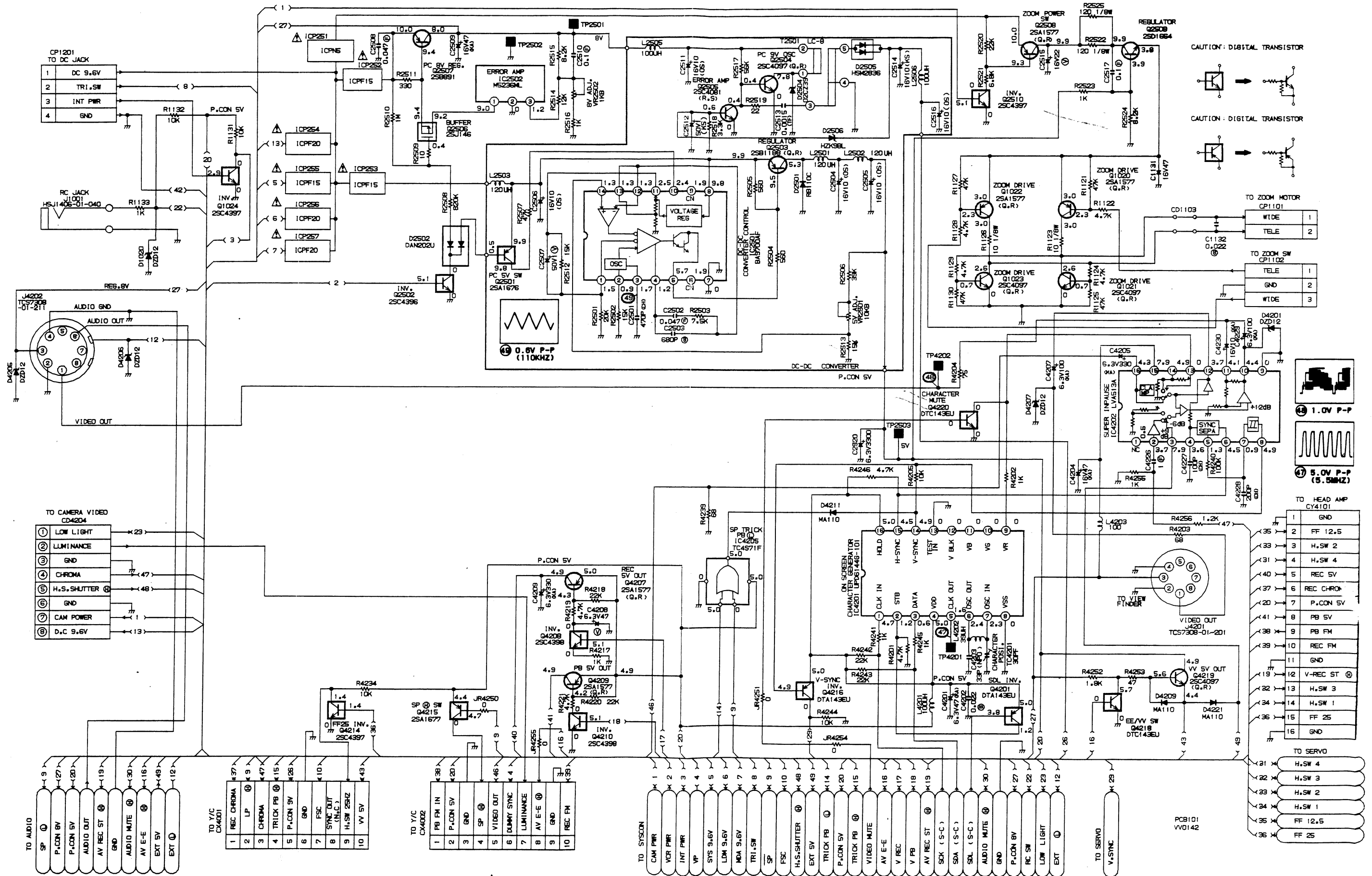
CAUTION: DIGITAL TRANSISTOR



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

HEAD AMP SCHEMATIC DIAGRAM

JACK SCHEMATIC DIAGRAM



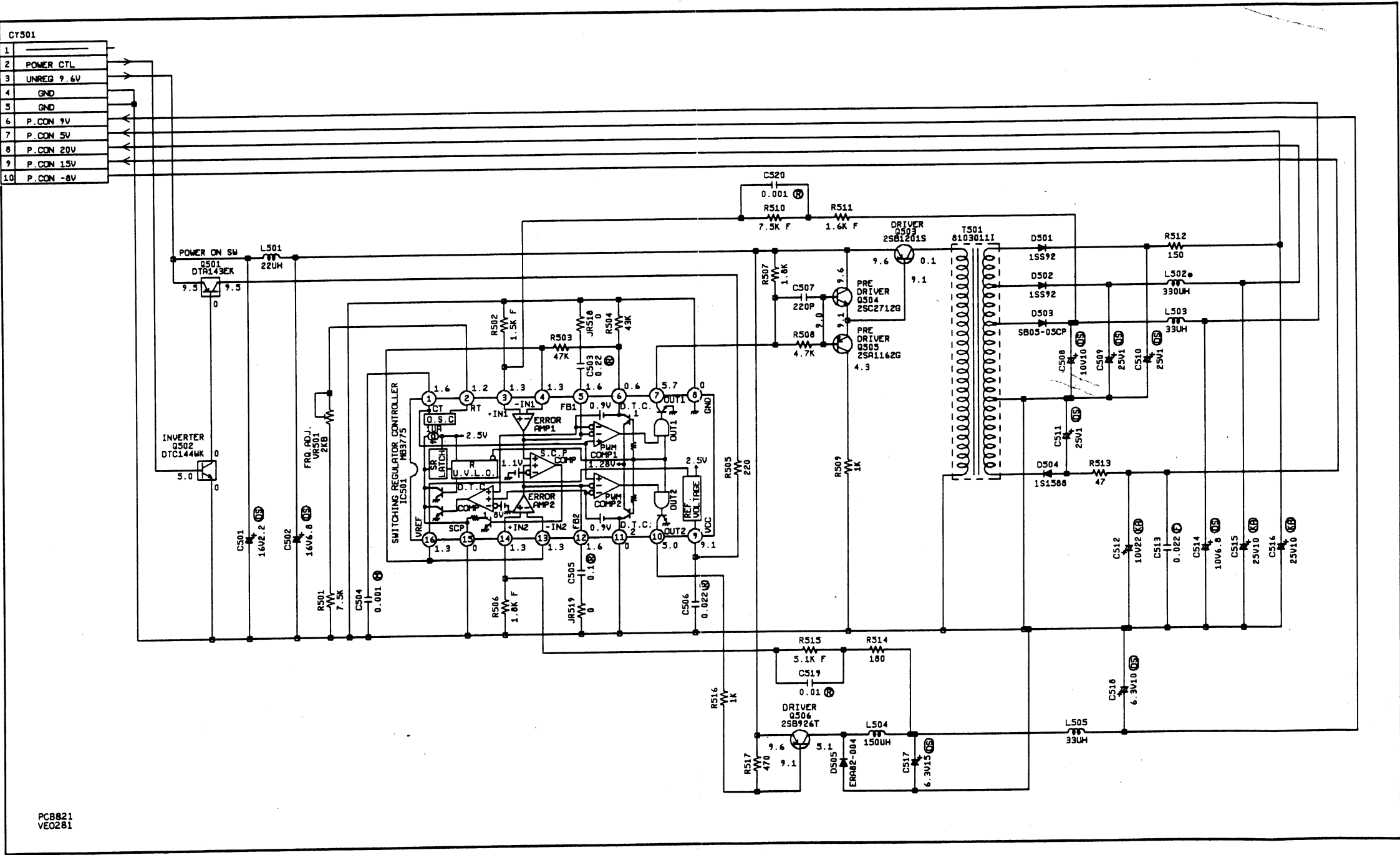
CAUTION: SINCE THESE PARTS MARKED BY ARE DANGEROUS AN POINT DE VUE SECURITE, USE ONLY THOSE DESCRIBED ON PARTS LIST ONLY.

ATTENTION: LES PIECES REPAREES PAR UN ETANT DANGEREUSES AN POINT DE VUE SECURITE, N'UTILISER QUE CELLES DECRIRES DANS LA NOMENCLATURE DES PIECES.

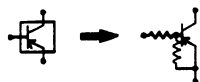
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

JACK SCHEMATIC DIAGRAM

DC-DC CONVERTER SCHEMATIC DIAGRAM



CAUTION: DIGITAL TRANSISTOR



CAUTION: DIGITAL TRANSISTOR



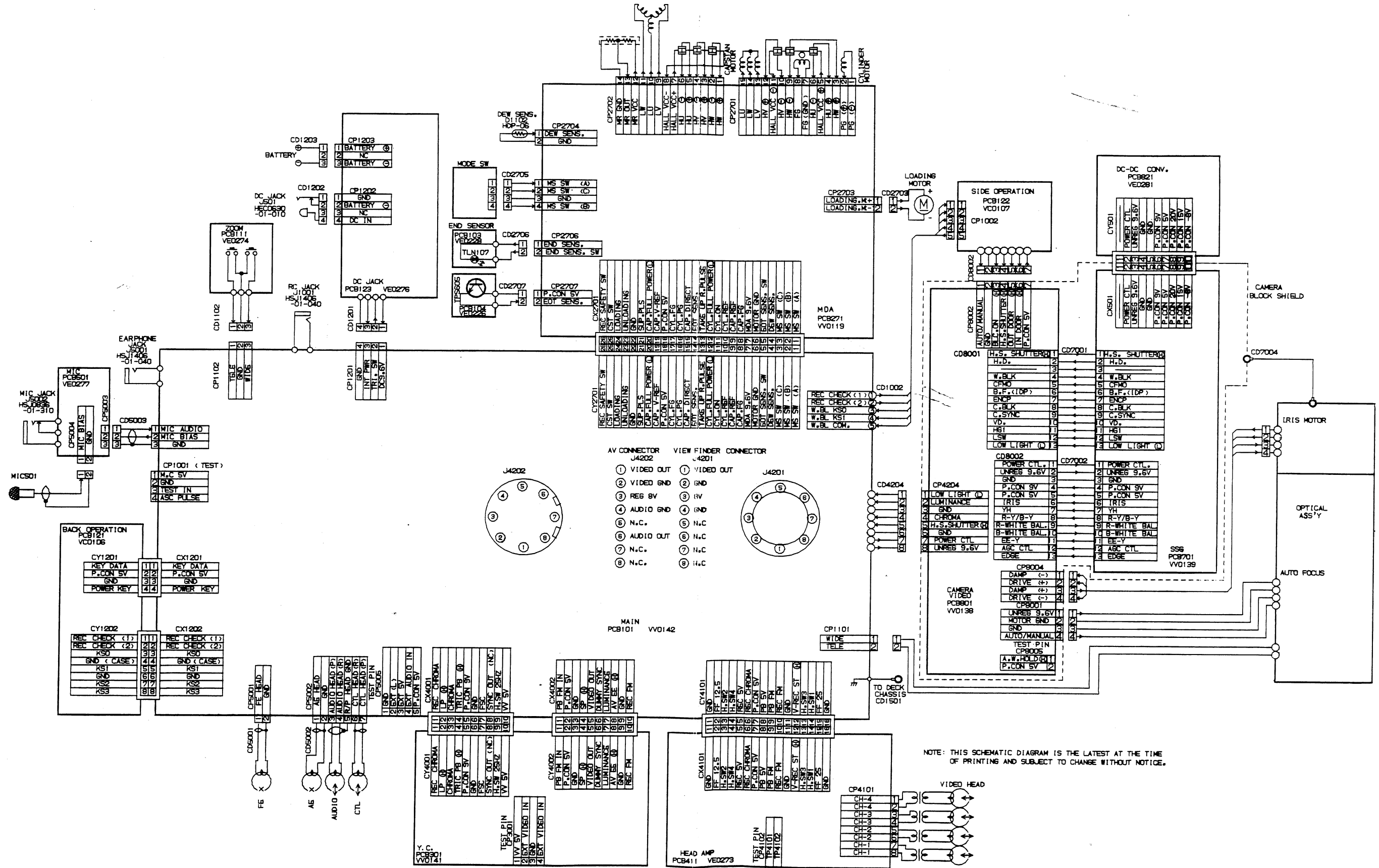
NOTE: F, G, H, I, AND J MARKED AROUND THE PARTS IN THE SCHEMATIC DIAGRAM INDICATES THE FOLLOWING ERROR RATE.
F: $\pm 1\%$, G: $\pm 2\%$, H: $\pm 3\%$, I: $\pm 4\%$, J: $\pm 5\%$

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

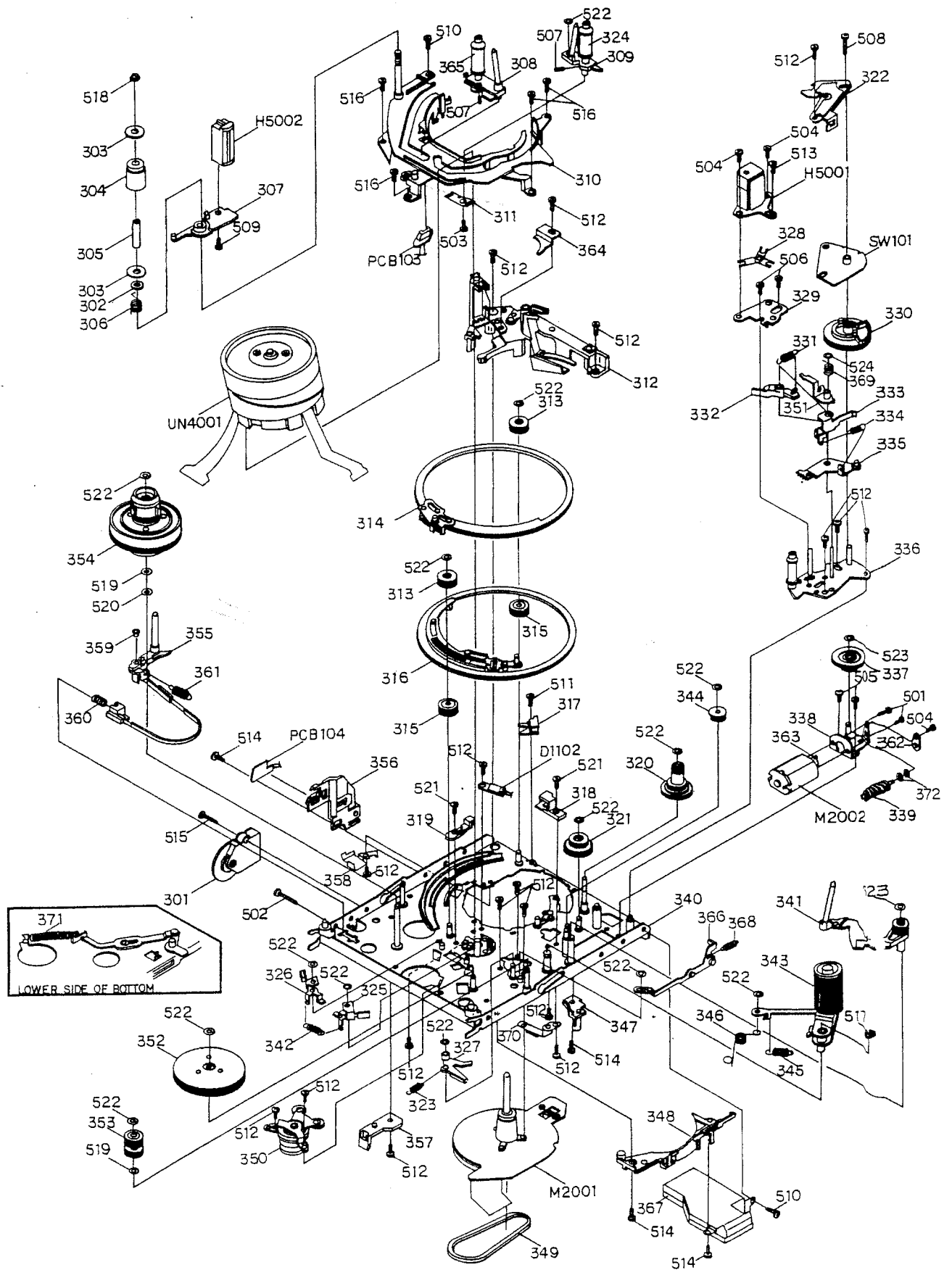
DC-DC CONVERTER SCHEMATIC DIAGRAM

1-7922

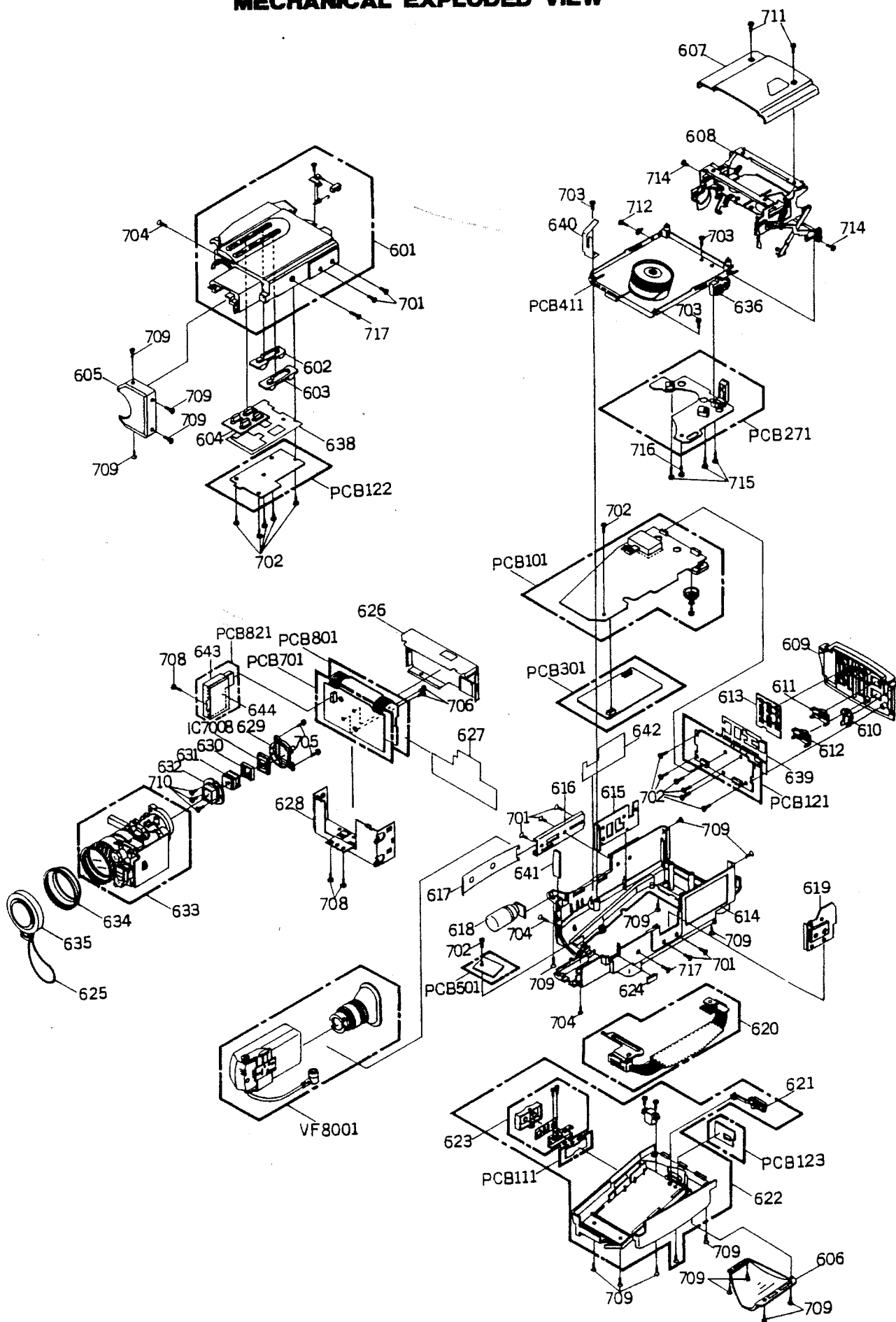
1-7911



DECK EXPLODED VIEW



MECHANICAL EXPLODED VIEW



ELECTRICAL REPLACEMENT PARTS LIST

REF. NO	PART NO	DESCRIPTION	REF. NO	PART NO	DESCRIPTION	
-RESISTORS-			-SEMICONDUCTORS (CONT)-			
R2703	R63514R68J	R.FUSE	IC501	100F037750	IC	MB3775PF-G-BND-TF
R2710	R63514R68J	R.FUSE	IC1001	154F50016B	IC	OEC0016B
R2765	R00106221J	RC	IC1002	107F00358F	IC	BA10358F-T1
-CAPACITORS-			IC1003	107T563090	IC	BAL6309
C501	E141022R2M	CE	IC1004	157F04093B	IC	BU4093BF-T1
C502	E141026R8M	CE	IC1005	158F08054H	IC	S-8054HN-CB
C504	P11100102J	CP	IC1006	158F01250H	IC	S-81250HG
C510	E14103010M	CE	IC1007	107F00358F	IC	BA10358F-T1
C511	E14103010M	CE	IC1008	196F04543S	IC	M54543ASL
C516	E51H03100M	CE	IC1201	155F04512B	IC	TC4512BF-TP1
C517	E14100150M	CE	IC1202	155F04013B	IC	TC4013BF
C518	E14100100M	CE	IC2001	191F48026A	IC	OEC8026
C1201	E01R00100M	CE	IC2002	107F00324F	IC	BA10324F-T1
C2040	P23200224J	CMPL	IC2003	107F00324F	IC	BA10324F-T1
			IC2501	107F99700A	IC	BA9700AF-T1
			IC2502	106F95236M	IC	M5236ML-T1
C2047	P23200333J	CMPL	IC2701	107F06431F	IC	BA6431F
C2513	P61600152J	CMPL	IC2702	107F06450F	IC	BA6450F
C2520	E01100332M	CE	IC2703	102F00393G	IC	UPC393G2-T1
C2712	E51H00221M	CE	IC2704	103F06358M	IC	LA6358M-TP-T1
C2753	P61500103J	CMPL				
C4018	P61500683J	CMPL	IC3001	103F37330M	IC	LA7330M-A-TP-T1
C4205	E51H00331M	CE	IC4001	103F37323M	IC	LA7323M-TP-T1
C4209	E51H00331M	CE	IC4002	158F06965M	IC	MSM6965-3MS-KR3
C5024	P61301823J	CMPL	IC4101	104F08043M	IC	HA118043MAEL
C5032	CH40B0413J	CC	IC4201	152F36144G	IC	UPD6144G-101-T1
			IC4202	10LFGA513A	IC	IC-LVA513A-2
			IC4205	155F04571F	IC	TC4571F(TE85LA)
C7019	E01P05010M	CE	IC5001	107F65114F	IC	BA5114F
C7031	E01100471M	CE	IC5002	105F77361F	IC	TA7361AF-TP1
C7067	E01101221M	CE	IC7001	19G02121J	IC	LZ2121J
C7068	E01101221M	CE				
-SEMI CONDUCTORS-			IC7002	152F06148G	IC	UPD6148G
			IC7003	152F06147G	IC	UPD6147G
D501	D170000920	DIODE, SILICON	IC7007	182F09314A	IC	UPD9314AGB
D502	D170000920	DIODE, SILICON	IC7008	182F09313A	IC	UPD9313AGB
D503	DD3R0505CP	DIODE, SILICON	IC7009	102F02370G	IC	UPC23700H
D504	D150015880	DIODE, SILICON	IC8001	102F02371G	IC	UPC23710H
D505	D1E0ERA820	DIODE, SILICON	IC8002	154F08056M	IC	HA118056MP
D1001	DD7RA2040U	DIODE, SILICON	IC8003	157F04052B	IC	BU4052BF-T1
D1002	DD7RA2040U	DIODE, SILICON	IC8004	104F01776A	IC	HA11776AMP
D1003	DD1RMA1100	DIODE, SILICON	IC8005	102F08181D	IC	MC-8181D
D1004	DD1RMA1100	DIODE, SILICON				
D1005	DD1RMA1100	DIODE, SILICON	IC8006	158F06831M	IC	MSM6831MS-KR2
			IC8007	103F06324N	IC	LA6324NM-TP-T1
			IC8008	158F06985M	IC	MSM6985MS-KR3
			IC8009	158F06985M	IC	MSM6985MS-KR3
D1006	DD1RMA1100	DIODE, SILICON				
D1007	DD1RMA1100	DIODE, SILICON				
D1020	DE3RB12000	DIODE, ZENER				
D1202	0020124T10	LED				
D1213	DD3RB2003P	DIODE, SILICON				
D1214	DD1RMA1100	DIODE, SILICON				
D2001	DD1RMA1100	DIODE, SILICON				
D2004	DD7RA2040U	DIODE, SILICON				
D2006	DD7RA2040U	DIODE, SILICON				
D2007	DD7RA2040U	DIODE, SILICON				
D2501	DD7RB1100C	DIODE, SILICON				
D2502	DD7RN2020U	DIODE, SILICON				
D2504	DE5RB39000	DIODE, ZENER				
D2505	DE4RM28360	DIODE, SILICON				
D2506	DE4RA090LB	DIODE, ZENER				
D2701	DD3R0505CP	DIODE, SILICON				
D2702	DD3R0505CP	DIODE, SILICON				
D3001	DD1RMA1100	DIODE, SILICON				
D3002	DD1RMA1100	DIODE, SILICON				
D3003	DD1RMA1100	DIODE, SILICON				
D3004	DD1RMA1100	DIODE, SILICON				
D4001	DD1RMA1100	DIODE, SILICON				
D4002	DD1RMA1100	DIODE, SILICON				
D4004	DD1RMA1100	DIODE, SILICON				
D4201	DE3RB12000	DIODE, ZENER				
D4205	DE3RB12000	DIODE, ZENER				
D4206	DE3RB12000	DIODE, ZENER				
D4207	DE3RB12000	DIODE, ZENER				
D4209	DD1RMA1100	DIODE, SILICON				
D4211	DD1RMA1100	DIODE, SILICON				
D4221	DD1RMA1100	DIODE, SILICON				
D5001	DD7RN2020U	DIODE, SILICON				
D5002	DE3RB12000	DIODE, ZENER				
D7001	DD1RMA1100	DIODE, SILICON				
D7002	DD1RMA1100	DIODE, SILICON				
D7003	DD1RMA1100	DIODE, SILICON				
D8001	DD1RMA1100	DIODE, SILICON				
D8002	DD1RMA1100	DIODE, SILICON				
D8003	DD1RMA1100	DIODE, SILICON				

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO	PART NO	DESCRIPTION	REF. NO	PART NO	DESCRIPTION
-SEMICONDUCTORS (CONT)-			-SEMICONDUCTORS (CONT)-		
Q2509	T97A016640	TRANSISTOR,SILICON	2SD1664T101	Q8016	T83A043990 TRANSISTOR,SILICON
Q2510	TN3TC07001	COMPOUND TRANSISTOR	2SC4397-TR	Q8017	T83A043990 TRANSISTOR,SILICON
Q2701	0002G00120	PHOTO COUPLER	GP2S098C	Q8018	T83A043990 TRANSISTOR,SILICON
Q2702	T73A011230	TRANSISTOR,SILICON	2SB1123-TD	Q8019	T83A043990 TRANSISTOR,SILICON
Q2703	TP1TL07001	COMPOUND TRANSISTOR	UN511D-TW	Q8020	T83A043990 TRANSISTOR,SILICON
Q2704	T73A011230	TRANSISTOR,SILICON	2SB1123-TD	Q8021	T83A043990 TRANSISTOR,SILICON
Q2705	TP1TL07001	COMPOUND TRANSISTOR	UN511D-TW		
Q2706	0002G00120	PHOTO COUPLER	GP2S098C		
Q2707	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q2708	TN7TC07001	COMPOUND TRANSISTOR	DTC124EUT107		
Q2709	TN7TC07001	COMPOUND TRANSISTOR	DTC124EUT107		
Q3001	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q3002	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q3003	T67A015760	TRANSISTOR,SILICON	2SA1576T107		
Q3004	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q3005	TN7TC07001	COMPOUND TRANSISTOR	DTC124EUT107		
Q3006	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q3007	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q4001	T67A015760	TRANSISTOR,SILICON	2SA1576T107		
Q4002	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q4003	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q4005	T67A015760	TRANSISTOR,SILICON	2SA1576T107		
Q4006	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q4007	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q4008	T67A015760	TRANSISTOR,SILICON	2SA1576T107		
Q4009	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q4010	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q4011	TN7TC07001	COMPOUND TRANSISTOR	DTC124EUT107		
Q4101	TN7TD07001	COMPOUND TRANSISTOR	DTC144EUT107		
Q4102	TN7TC08A01	COMPOUND TRANSISTOR	FMG1T99		
Q4103	TN7TC08A01	COMPOUND TRANSISTOR	FMG1T99		
Q4104	TR7A0FMW10	TRANSISTOR,ARRAY	FMW1T99		
Q4105	TR7A0FMW10	TRANSISTOR,ARRAY	FMW1T99		
Q4201	TP7TA07001	COMPOUND TRANSISTOR	DTA143EUT107		
Q4207	T67A015770	TRANSISTOR,SILICON	2SA1577T107		
Q4208	TN3TB07001	COMPOUND TRANSISTOR	2SC4398-TR		
Q4209	T67A015770	TRANSISTOR,SILICON	2SA1577T107		
Q4210	TN3TB07001	COMPOUND TRANSISTOR	2SC4398-TR		
Q4214	TN3TC07001	COMPOUND TRANSISTOR	2SC4397-TR		
Q4215	TP3TC07001	COMPOUND TRANSISTOR	2SA1677-TR		
Q4216	TP7TA07001	COMPOUND TRANSISTOR	DTA143EUT107		
Q4218	TN7TA07001	COMPOUND TRANSISTOR	DTC143EUT107		
Q4219	T87A040970	TRANSISTOR,SILICON	2SC4097T107		
Q4220	TN7TA07001	COMPOUND TRANSISTOR	DTC143EUT107		
Q5001	TN3TB07001	COMPOUND TRANSISTOR	2SC4398-TR		
Q5002	T87A04097R	TRANSISTOR,SILICON	2SC4097T107R		
Q5003	T87A04097R	TRANSISTOR,SILICON	2SC4097T107R		
Q5004	TN3TD07001	COMPOUND TRANSISTOR	2SC4396-TR		
Q5005	TN3TD07001	COMPOUND TRANSISTOR	2SC4396-TR		
Q5006	TN3TD07001	COMPOUND TRANSISTOR	2SC4396-TR		
Q5007	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q5008	T67A015770	TRANSISTOR,SILICON	2SA1577T107		
Q5010	TN3TD07001	COMPOUND TRANSISTOR	2SC4396-TR		
Q5011	TN3TB07001	COMPOUND TRANSISTOR	2SC4398-TR		
Q5012	T87A040810	TRANSISTOR,SILICON	2SC4081T107		
Q7001	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q7002	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q7003	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q7004	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q7005	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q7006	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q7007	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q7008	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q7009	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q7010	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q7011	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q7012	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q7013	TS7M000001	COMPOUND TRANSISTOR(IC)	IMX1T110		
Q7014	TS7M000001	COMPOUND TRANSISTOR(IC)	IMX1T110		
Q7015	TS7M000002	COMPOUND TRANSISTOR(IC)	IMT1T110		
Q8001	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q8002	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q8003	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q8004	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q8005	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q8006	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q8007	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q8008	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q8009	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q8010	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q8011	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q8012	T63A016880	TRANSISTOR,SILICON	2SA1688-TR		
Q8013	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		
Q8014	T83A043990	TRANSISTOR,SILICON	2SC4399-0-TR		

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO	PARTS. NO	DESCRIPTION	REF. NO	PARTS. NO	DESCRIPTION
-SWITCHES-			-MISCELLANEOUS (CONT)-		
SW1202	0510321A01	SWITCH, SLIDE	CD5003	068393005A	CORD, EIS CONNECTOR
SW1210	0510322A01	SWITCH, SLIDE	CD5004	068392011A	CORD, EIS CONNECTOR
SW1211	0510321A01	SWITCH, SLIDE	CD7001	12270D3001	CORD, JUMPER
SW1221	0510322A01	SWITCH, SLIDE	CD7002	12270D3001	CORD, JUMPER
SW1224	0504201018	SWITCH, TACT	CD7004	068101205A	CORD, CONNECTOR
SW1225	0510332A01	SWITCH, SLIDE	CD8001	0680L05004	CABLE, PAL
SW2701	0552111002	SWITCH, MICRO	CD8002	0680M08001	CORD, CONNECTOR
SW2702	0550A11015	SWITCH, LEAF	CP1001	0693940049	CONNECTOR, PCB SIDE
			CP1002	0693950049	CONNECTOR, PCB SIDE
			CP1101	0693920049	CONNECTOR, PCB SIDE
-VARIABLE RESISTORS-			CP1102	0693930049	CONNECTOR, PCB SIDE
VR501	V11B323801	VR, SEMI FIXED	CP1201	0693940049	CONNECTOR, PCB SIDE
VR1001	V11C3E58M1	VR, SEMI FIXED	CP1202	0693940039	CONNECTOR, PCB SIDE
VR2001	V11C3H58M1	VR, SEMI FIXED	CP1203	0693930039	CONNECTOR, PCB SIDE
VR2002	V025025802	VR, ROTARY	CP2701	069R2F0229	CONNECTOR, PCB SIDE
VR2003	V11C3158M1	VR, SEMI FIXED	CP2702	069R2E0239	CONNECTOR, PCB SIDE
VR2501	V11C3148M1	VR, SEMI FIXED	CP2703	0693920049	CONNECTOR, PCB SIDE
VR2502	V11C3138M1	VR, SEMI FIXED	CP2704	0693920049	CONNECTOR, PCB SIDE
VR3001	V11C3138M1	VR, SEMI FIXED	CP2706	0693920049	CONNECTOR, PCB SIDE
VR4001	V11C3148M1	VR, SEMI FIXED	CP2707	0693920049	CONNECTOR, PCB SIDE
VR4002	V11C3H48M1	VR, SEMI FIXED	CP3001	0693940049	CONNECTOR, PCB SIDE
VR4003	V11C3L38M1	VR, SEMI FIXED	CP4101	069R280219	CONNECTOR, PCB SIDE
VR4004	V11C3148M1	VR, SEMI FIXED	CP4102	0693920049	CONNECTOR, PCB SIDE
VR4005	V11C3138M1	VR, SEMI FIXED	CP4204	0693980049	CONNECTOR, PCB SIDE
VR4006	V11C3148M1	VR, SEMI FIXED	CP5001	0693920049	CONNECTOR, PCB SIDE
VR5001	V11C3158M1	VR, SEMI FIXED	CP5002	0693970039	CONNECTOR, PCB SIDE
VR5002	V11C3H48M1	VR, SEMI FIXED	CP5003	0693930039	CONNECTOR, PCB SIDE
VR7001	V11C3158M1	VR, SEMI FIXED	CP5004	0693920039	CONNECTOR, PCB SIDE
VR7002	V11C3148M1	VR, SEMI FIXED	CP5005	0693950049	CONNECTOR, PCB SIDE
VR7003	V11C3148M1	VR, SEMI FIXED	CP8001	0693940039	CONNECTOR, PCB SIDE
VR7004	V11C3148M1	VR, SEMI FIXED	CP8002	0693970039	CONNECTOR, PCB SIDE
VR7005	V11C3U38M1	VR, SEMI FIXED	CP8004	0693940039	CONNECTOR, PCB SIDE
VR7006	V11C3148M1	VR, SEMI FIXED	CP8005	0693920039	CONNECTOR, PCB SIDE
VR7007	V11C3U38M1	VR, SEMI FIXED	CT8001	1401530001	TAPE, VIDEO CASSETTE
VR7008	V11C3U38M1	VR, SEMI FIXED	CX1201	069R740030	CONNECTOR, PCB SIDE
VR7009	V11C3148M1	VR, SEMI FIXED	CX1202	069R780030	CONNECTOR, PCB SIDE
VR7010	V11C3148M1	VR, SEMI FIXED	CX2701	069R9Q0129	CONNECTOR, PCB SIDE
VR7011	V11C3H48M1	VR, SEMI FIXED	CX4001	069R9A0109	CONNECTOR, PCB SIDE
VR8001	V11C3138M1	VR, SEMI FIXED	CX4002	069R9A0109	CONNECTOR, PCB SIDE
VR8002	V11C3H38M1	VR, SEMI FIXED	CX4101	069R9G0129	CONNECTOR, PCB SIDE
VR8003	V11C3H38M1	VR, SEMI FIXED	CY1201	069R740040	CONNECTOR, PCB SIDE
VR8004	V11C3148M1	VR, SEMI FIXED	CY1202	069R780040	CONNECTOR, PCB SIDE
VR8005	V11C3148M1	VR, SEMI FIXED	CY2701	069R9Q0099	CONNECTOR, PCB SIDE
VR8006	V11C3U48M1	VR, SEMI FIXED	CY4001	069R9A0099	CONNECTOR, PCB SIDE
VR8007	V11C3148M1	VR, SEMI FIXED	CY4002	069R9A0099	CONNECTOR, PCB SIDE
VR8008	V11C3148M1	VR, SEMI FIXED	CY4101	069R9G0099	CONNECTOR, PCB SIDE
VR8009	V11C3148M1	VR, SEMI FIXED	DL3001	104A24R438	DELAY LINE, GLASS
VR8010	V11C3148M1	VR, SEMI FIXED	ICP121	084E340001	IC PROTECTOR
VR8011	V11C3148M1	VR, SEMI FIXED	ICP251	08470R2501	IC PROTECTOR
VR8012	V11C3Q38M1	VR, SEMI FIXED	ICP252	084700R601	IC PROTECTOR
VR8013	V11C3Q28M1	VR, SEMI FIXED	ICP253	084700R601	IC PROTECTOR
VR8014	V11C3148M1	VR, SEMI FIXED	ICP254	084700R801	IC PROTECTOR
VR8015	V11C3H38M1	VR, SEMI FIXED	ICP255	084700R601	IC PROTECTOR
VR8016	V11C3H38M1	VR, SEMI FIXED	ICP256	084700R801	IC PROTECTOR
			ICP257	084700R801	IC PROTECTOR
-P.C. BOARDS ASS'Y-			PF2002	11312A0001	RC COMPOUND
PCB101	A43404A01A	PCB ASS'Y	PF3001	1147B445T1	FILTER, BAND PASS
PCB111	A43404A29A	PCB ASS'Y	PF3002	1147L145T1	FILTER, LOW PASS
PCB121	A43404A27A	PCB ASS'Y	PF3003	1147B506T5	FILTER, BAND PASS
PCB122	A43404A28A	PCB ASS'Y	PF3004	1147L125T1	FILTER, LOW PASS
PCB123	A43404A22A	PCB ASS'Y	PF4001	1147L306T8	FILTER, LOW PASS
PCB271	A43404A15A	PCB ASS'Y	PF4002	1147H145T1	FILTER, HIGH PASS
PCB301	A43404A30A	PCB ASS'Y	PF4003	1147L306T9	FILTER, LOW PASS
PCB411	A43404A33A	PCB ASS'Y	PF4004	103802R6T3	DELAY
PCB501	A43404A19A	PCB ASS'Y	PF5001	1147T153T1	FILTER, TRAP LC
PCB701	A43404A12A	PCB ASS'Y	PF5002	114DL123T2	FILTER, LOW PASS
PCB801	A43404A13A	PCB ASS'Y	PF7001	1162L012M1	FILTER, EMI
PCB821	A43404A25A	PCB ASS'Y	PF7002	1162L012M1	FILTER, EMI
			PF7003	1162L012M1	FILTER, EMI
-MISCELLANEOUS-			PF7004	103803R9T1	DELAY
AD8001	0415030071	AC ADAPTER	PF7005	1147L406T1	FILTER, LOW PASS
BT8001	1413300002	BATTERY, NICAD	PF7006	1162L0H4Z1	FILTER, EMI
BT8003	141T003004	BATTERY, MANGAN	PF8001	1162L012M1	FILTER, EMI
CX501	069R2A0269	CONNECTOR, PCB SIDE	PF8002	1162L0K2M1	FILTER, EMI
CY501	069R2A0299	CONNECTOR, PCB SIDE	PF8003	1162L0K2M1	FILTER, EMI
CD1002	068395002A	CORD, EIS CONNECTOR	PF8004	1162L0K2M1	FILTER, EMI
CD1102	068393004A	CORD, EIS CONNECTOR	PF8005	103801R8T3	DELAY
CD1103	068392010A	CORD, EIS CONNECTOR	PF8006	103801R8T1	DELAY
CD1201	068394007A	CORD, EIS CONNECTOR	PF8007	103801R8T1	DELAY
CD1202	068394008A	CORD, EIS CONNECTOR	PF8008	1147L446T1	FILTER, LOW PASS
CD1203	068393006A	CORD, EIS CONNECTOR	PF8009	1147L176T1	FILTER, LOW PASS
CD1501	068301149A	CORD, CONNECTOR	PF8010	1147L176T1	FILTER, LOW PASS
CD2705	068394006A	CORD, EIS CONNECTOR	PF8011	1147L116T1	FILTER, LOW PASS
CD4204	068398002A	CORD, EIS CONNECTOR			

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO	PART NO	DESCRIPTION
-MISCELLANEOUS (CONT)-		
PF8012	1147L116T1	FILTER, LOW PASS 1147L116T1
PF8013	1147B446T7	FILTER, BAND PASS 47B446T7
TC4201	0100114M01	C. CERAMIC TRIMMER ECR-JA030E12X
TC7001	0100112M01	C. CERAMIC TRIMMER ECR-JA020E12X
TC8001	1401700001	TAPE ADAPTER KVA501050
TU8001	0150701001	RF CONVERTOR 50701001
VF8001	09C1000001	E. VIEW FINDER KVF300298
X1001	1002A4R007	CERAMIC OSCILLATOR CST4.00MGW
X3001	1006F4R301	CRYSTAL HC-49/U 4.43361875HZ
X7001	1006A01901	CRYSTAL P2-19.3125MHZ

RESISTOR
RC.....CARBON RESISTOR

CAPACITORS
CC.....CERAMIC CAPACITOR
CE.....ALUMI ELECTROLYTIC CAPACITOR
CP.....POLYESTER CAPACITOR
CPP.....POLYPROPYLENE CAPACITOR
CPL.....PLASTIC CAPACITOR
CMP.....METAL POLYESTER CAPACITOR
CMPL.....METAL PLASTIC CAPACITOR
CMPP.....METAL POLYPROPYLENE CAPACITOR
CST.....STYROL CAPACITOR

DECK REPLACEMENT PARTS LIST

REF. NO	PART NO	DESCRIPTION	REF. NO	PART NO	DESCRIPTION	
301	850A900067	DAMPER ASS'Y	501	867391B201	CAMERA SCREW	M1.6*2.0 NI
302	850P600221	COLLAR, IMPEDANCE R.3	502	867391CA02	CAMERA SCREW	M1.7*1.0 BK
303	850P600184	FLANGE, IMPEDANCE ROLLER	503	867391C122	CAMERA SCREW	M1.7*1.2 BK
304	850A400061	ROLLER, IMPEDANCE ASS'Y	504	867401C182	CAMERA SCREW	M1.7*1.8 BK
305	850P400201	COLLAR, IMPEDANCE	505	867391C252	CAMERA SCREW	M1.7*2.5 BK
306	850P800100	SPRING, FE HEAD ARM	506	867391C282	CAMERA SCREW	M1.7*2.8 BK
307	850P500026	ARM, FE HEAD	507	8683DZA301	SET SCREW CUT POINT	M1.2*3.0 NI
308	850A400053	S. INCLINED BASE ASS'Y	508	867401CA02	CAMERA SCREW	M1.7*1.0 BK
309	850A400054	T. INCLINED BASE ASS'Y	509	867401B301	CAMERA SCREW	M1.6*3.0 NI
310	850A100007	LOADING RAIL ASS'Y	510	867401C202	CAMERA SCREW	M1.7*2.0 BK
311	850P400181	PLATE, T. INCLINED BASE	511	867391C302	CAMERA SCREW	M1.7*3.0 BK
312	850A600076	UV BASE ASS'Y	512	867401C302	CAMERA SCREW	M1.7*3.0 BK
313	850P300083	GEAR, GUIDE S.	513	867401C304	CAMERA SCREW	M1.7*3.0 CH
314	850A300023	S. RING ASS'Y	514	867401C402	CAMERA SCREW	M1.7*4.0 BK
315	850P300084	GEAR, GUIDE T.	515	867401C602	CAMERA SCREW	M1.7*5.0 BK
316	850A300024	T. RING ASS'Y	516	867391C254	CAMERA SCREW	M1.7*2.5 CH
317	850P000136	HOLDER, RING GEAR C	517	868NETW251	E-RING	2.5
318	850P000134	HOLDER, RING GEAR A	518	868N002204	NUT	M2
319	850P000135	HOLDER, RING GEAR B	519	868WP1632E	POLYSLIDER WASHER	1.6*3.2*T0.13
320	850P600162	GEAR, TERMINAL	520	868WP1632J	POLYSLIDER WASHER	1.6*3.2*T0.25
321	850P300079	GEAR, LOADING A	521	867401C252	CAMERA SCREW	M1.7*3.0 BK
322	850P600209	UPPER, S.M.P	522	868WQ1230J	POLYSLIDER WASHER (CUT)	1.2*3.0*T0.25
323	850P800124	SPRING, SUB BRAKE 2	523	868WQ2647Q	POLYSLIDER WASHER (CUT)	2.6*4.7*T0.5
324	850A400063	T-G ROLLER ASS'Y 2	524	868WQ1732L	POLYSLIDER WASHER (CUT)	1.7*3.2*T0.3
325	850A600077	MAIN BRAKE R ASS'Y	CD2703	068392006A	CORD EIS CONNECTOR	8392006A
326	850A600078	MAIN BRAKE L ASS'Y	CD2706	068392007A	CORD EIS CONNECTOR	8392007A
327	850A600079	ARM, SUB BRAKE ASS'Y	CD2707	068392008A	CORD EIS CONNECTOR	8392008A
328	850P800102	SPRING, AZIMUTH	CD5001	068392009A	CORD EIS CONNECTOR	8392009A
329	850P500028	BASE, AC HEAD 2	CD5002	068397002A	CORD EIS CONNECTOR	8397002A
330	850P600213	GEAR, CAM 2	D1101	0010500020	LED	TLN107A
331	850P800126	SPRING, LOCK ARM 2	D1102	DAK0000100	DEW SENSOR	HDP-06-A5
332	850P600214	ARM, LOCK 2	H5001	1523191009	HEAD, AUDIO CONTROL	C-421 1-AC-321
333	850P600215	LEVER, LOCK ARM 2	H5002	1543D04002	HEAD, FULL ERASE	HVFVA0014A
334	850P800119	SPRING, FAN SHAPED	M2001	1510398010	CAPSTAN DD UNIT	B7NJ303
335	850A600083	F-S, GEAR 2 ASS'Y	M2002	1596918001	MOTOR, LOADING	MIN-6GC04B
336	850A600084	DECK PLATE 2 ASS'Y	PCB103	A43401A430	PCB ASS'Y	VE022 8
337	850P600161	GEAR, WORM WHEEL	PCB104	A43401A500	PCB ASS'Y	VE022 6
338	850A300025	LOADING M. BRACKET ASS'Y	Q1101	000050002D	TRANSISTOR, PHOTO	TPS606-D
339	850A600058	WORM ASS'Y	SW101	0520943003	SWITCH, ROTARY	SIM03 20
340	850A000022	MAIN CHASSIS 2 ASS'Y	UN4001	1590D00051	UNIT, CYLINDER	CYCA4 P002A
341	850A600081	MIDDLE POST ARM 2 ASS'Y				
342	850P800125	SPRING, MAIN BRAKE				
343	850A400058	PINCH ROLLER ARM 2 ASS'Y				
344	850P300080	GEAR, LOADING B				
345	850P800122	SPRING, PINCH ROLLER				
346	850P800106	SPRING, P-R ACTUATOR				
347	850P000153	HOLDER, HEAD AMP				
348	850P000151	COVER, MOTOR				
349	850P600170	BELT, CAPSTAN				
350	850A200015	C-PULLEY BRACKET 2 ASS'Y				
351	850A600082	LOCK ARM UPPER ASS'Y				
352	850A200016	T. REEL GEAR 2 ASS'Y				
353	850P200065	GEAR, JOINT CASS.				
354	850A200017	S. REEL 2 ASS'Y				
355	850A400050	TENSION SERVO ASS'Y				
356	850P700029	HOLDER, END SENSOR				
357	850P000152	BRACKET M.D.A				
358	850P000139	COVER, SHIELD				
359	850P400151	CAP, TENSION ARM				
360	850P800104	SPRING, TENSION ADJUST				
361	850P800103	SPRING, TENSION ARM				
362	850P300088	BEARING, WORM				
363	850P600160	DRIVER, WORM				
364	850P600171	GUIDE, S. INCLINED				
365	850A400062	S-G ROLLER ASS'Y 2				
366	850A600080	SB, ROD ASS'Y				
367	850P000155	LID, HEAD AMP SHIELD				
368	850P800123	SPRING, SUB BRAKE ROD				
369	850P800127	SPRING, LOCK ARM UPPER				
370	850AAA0016	EARTH PLATE ASS'Y				
371	850P800120	SPRING, ROD MAIN BRAKE				
372	867WT1026D	LUMILAR WASHER				

MECHANICAL REPLACEMENT PARTS LIST

REF.NO	PART NO	DESCRIPTION	REF.NO	PART NO	DESCRIPTION	
601	A43404A793	CABINET, SIDE ASS'Y	701	8102320502	FLAT	M2*5 BK
602	733JPA0047	KNOB, FOCUS	702	8110220504	TAP TITE(P) BIND	2*5 CH
603	733JPA0048	KNOB, WHITE BALANCE	703	8117126A24	TAPPING(B0) PAN	2.6*12 CH
604	735JPA0456	RUBBER, SIDE(OP,2)	704	8144326602	TAPPING(B1) FLAT	2.6*6 BK
605	711JPD0060	COVER, AF	705	8108120804	SEMS(B)	M2*8 CH
606	703JPA0013	COVER, BATTERY	706	8117120404	TAPPING(B0) PAN	2*4 CH
607	A43404A783	LID CASSETTE ASS'Y	708	8110126404	TAP TITE(P)	2.6*4 CH
608	A43401A650	STAGE ASS'Y	709	8110320502	TAP TITE(P) FLAT	2*5 BK
609	711JJP0092	PANEL BACK				
610	733JPA0041	KNOB, MODE	710	8140120402	PAN	M2*4 BK
611	733JPA0050	KNOB, SLIDE (BLUE)	711	8102120402	PAN	M2*4 BK
612	733JPA0049	KNOB, SLIDE (BLACK)	712	8139117022	PAN	M1.7*2 BK
613	735JPD0582	RUBBER BACK	714	867391C302	CAMERA SCREW	M1.7*3.0 BK
614	711JJP0093	CABINET, MAIN SHEET, RATING	715	867401C802	CAMERA SCREW	M1.7*8.0 BK
615	761JAA0007	ANGLE VF	716	867401C602	CAMERA SCREW	M1.7*6.0 BK
616	762JAE0001	SHOES, FOOT	717	8102220502	BIND	M2*5 BK
617	744JUB0001	SPRING, SHOES				
618	709JPB0002	MIC, UNIT	---	J1ACVAA02B	GUARANTEE CARD	
619	702JPA0325	PLATE, STAND	---	J4330128B	WARNING SHEET	
620	A43401A753	BAND, GRIP ASS'Y	---	J4340401A	INSTRUCTION BOOK	
621	733JPA0046	BUTTON, REC	---	J4340420A	CAUTION SHEET	
622	A43404A803	CABINET, BATTERY ASS'Y	---	791JHA0091	LIGHTRON, BAG	
623	733JPA0042	BUTTON, ZOOM	---	792JHA0178	PACKAGE TOP	
624	713JRA0003	RUBBER, AOF	---	792JHA0179	PACKAGE BOTTOM	
625	794JLA0021	STRING, CAP LENS	---	793JCD1992	GIFT BOX	
626	752JSA0264	LID SHILD CASE	---	A43401A743	SHOULDER, STRAP ASS'Y	
627	755JDA0026	SHIELD FILM	---	794JPD0001	SHOULDER, STRAP	
628	752JSA0268	SHIELD CASE	---	705JHA0001	HOLDER, STRAP	
629	756JEA0002	BASE, CCD	---	705JUE0001	ANGLE, STRAP	
630	800JRA0008	RUBBER, FILTER				
631	890SV47C00	OPTICAL LOW PAS FILTER				
632	756JPA0018	COVER, CCD				
633	709JPG0001	LENS, ASS'Y				
634	713JPA0122	LENS, HOOD				
635	706JPA0010	CAP LENS				
636	800JRO0039	CUSHION				
638	755JDA0024	SHIELD, FILM(SIDE)				
639	755JDA0025	SHIELD, FILM(BACK)				
640	753JEA0007	EARTH SPRING (DECK)				
641	7232020214	PLATE, BRAND				
642	755JDA0027	SHIELD, FILM				
643	752JSA0274	SHIELD, CASE(TOP)				
644	752JSA0275	SHIELD, CASE(BOTTOM)				